
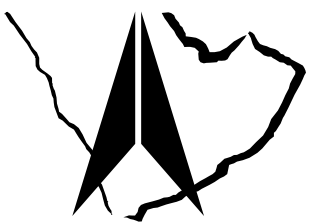
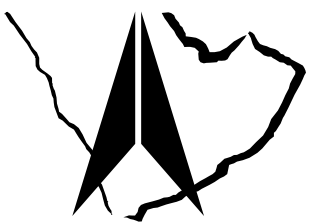
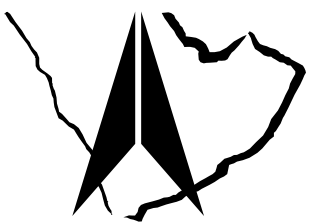
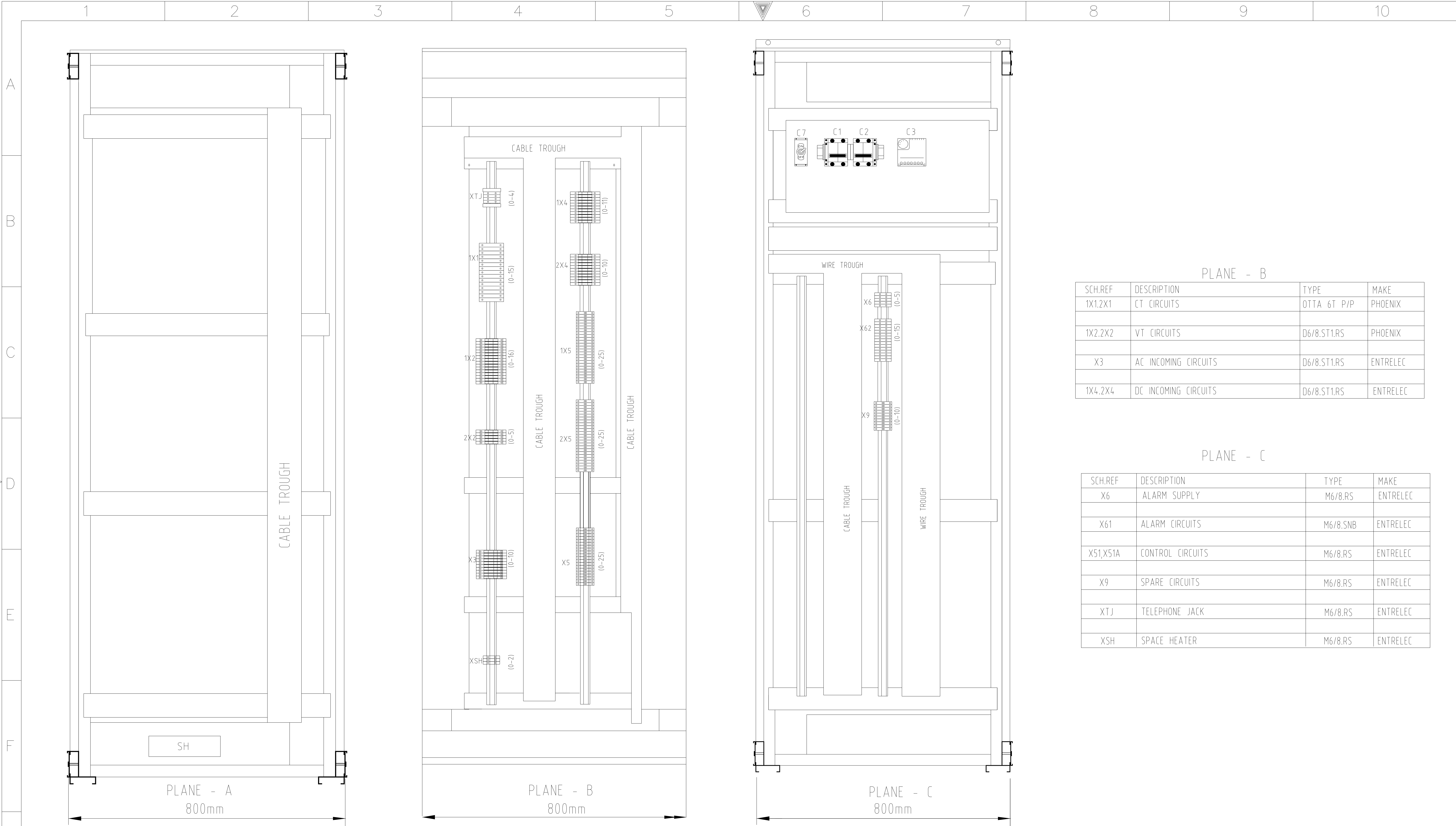


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A			POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656					ABB AUTOMATION COMPANY LTD., 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A																																																									
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	SUBSTATION : S/S 8709																																																																
E	CONTRACT NO. : 11131113/00																																																																
	TITLE : Assembly Drawing - +CBP1 [CAPACITOR BANK1]																																																																
F																																																																	
G	<table><tr><td colspan="3">AS-BUILT BY _____ DATE _____</td><td colspan="2">CONTRACT NO. 11131113/00</td><td colspan="2">JOB ORDER NO. S-13656</td><td colspan="2">COVER SHEET</td><td colspan="2"><div>الشركة الوطنية لنقل الكهرباء</div><div> <b>نقل الكهرباء</b> National Grid sa</div></td></tr><tr><td></td><td></td><td></td><td colspan="2">DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u></td><td colspan="2"></td><td colspan="2">13.8kV CAPACITOR BANK-1 PROT. PANEL</td><td colspan="2">INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.</td></tr><tr><td></td><td>01</td><td>13 48</td><td colspan="2">AS MANUFACTURED</td><td colspan="2">DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____</td><td colspan="2">S/S 8709-132/13.8KV IN AL-KHARJ CITY</td><td colspan="2">- C421 CD-322951 G00 G01 01</td></tr><tr><td></td><td>00</td><td>13 04</td><td colspan="2">FOR APPROVAL</td><td colspan="2">OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u></td><td colspan="2">RIYADH SAUDI ARABIA</td><td colspan="2"></td></tr><tr><td></td><td>REV. NO.</td><td>DATE</td><td colspan="2">DESCRIPTION</td><td colspan="2"></td><td colspan="2"></td><td colspan="2"></td></tr></table>										AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COVER SHEET		<div>الشركة الوطنية لنقل الكهرباء</div> <div> <b>نقل الكهرباء</b> National Grid sa</div>					DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u>				13.8kV CAPACITOR BANK-1 PROT. PANEL		INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.			01	13 48	AS MANUFACTURED		DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____		S/S 8709-132/13.8KV IN AL-KHARJ CITY		- C421 CD-322951 G00 G01 01			00	13 04	FOR APPROVAL		OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>		RIYADH SAUDI ARABIA					REV. NO.	DATE	DESCRIPTION							
AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COVER SHEET		<div>الشركة الوطنية لنقل الكهرباء</div> <div> <b>نقل الكهرباء</b> National Grid sa</div>																																																								
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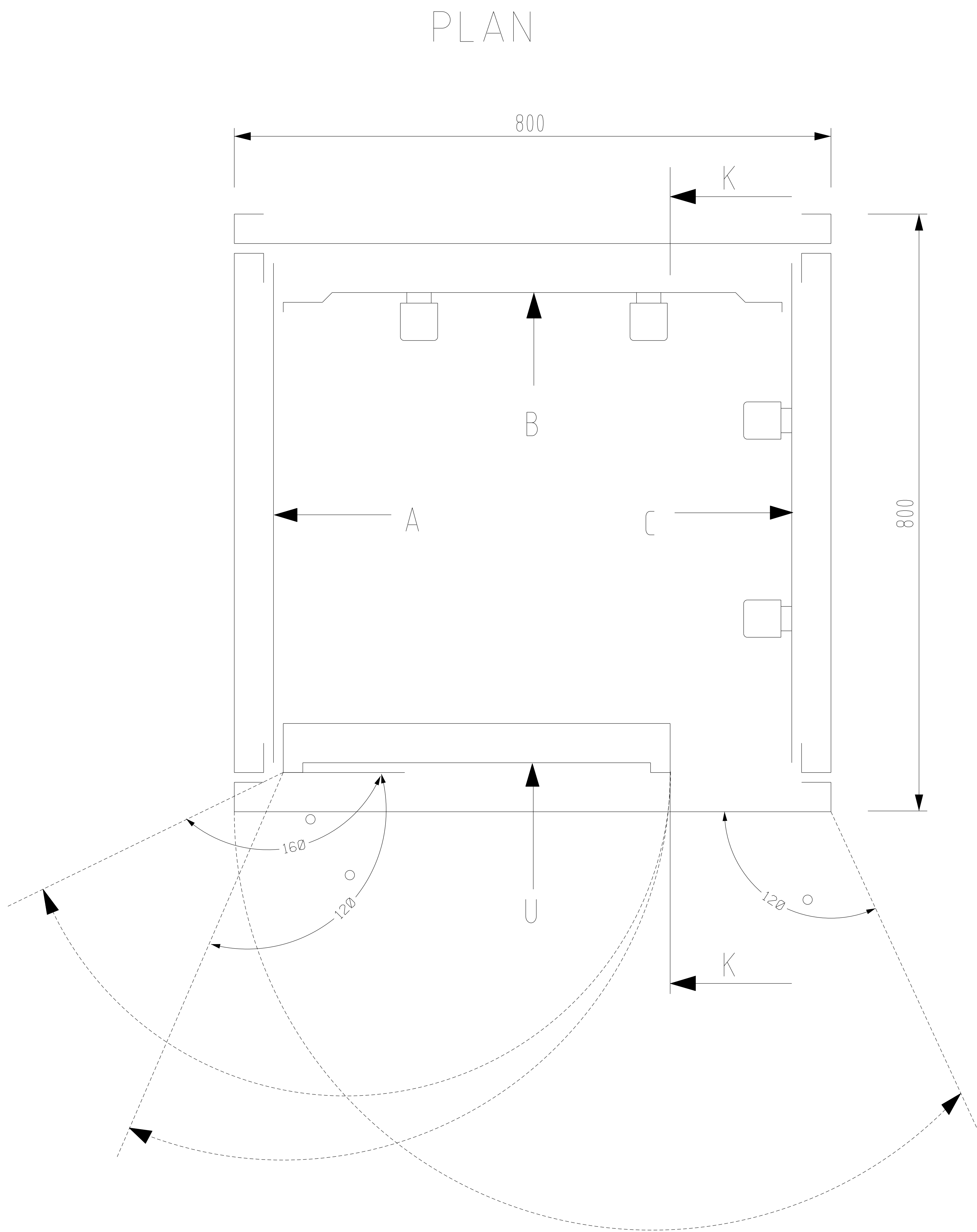
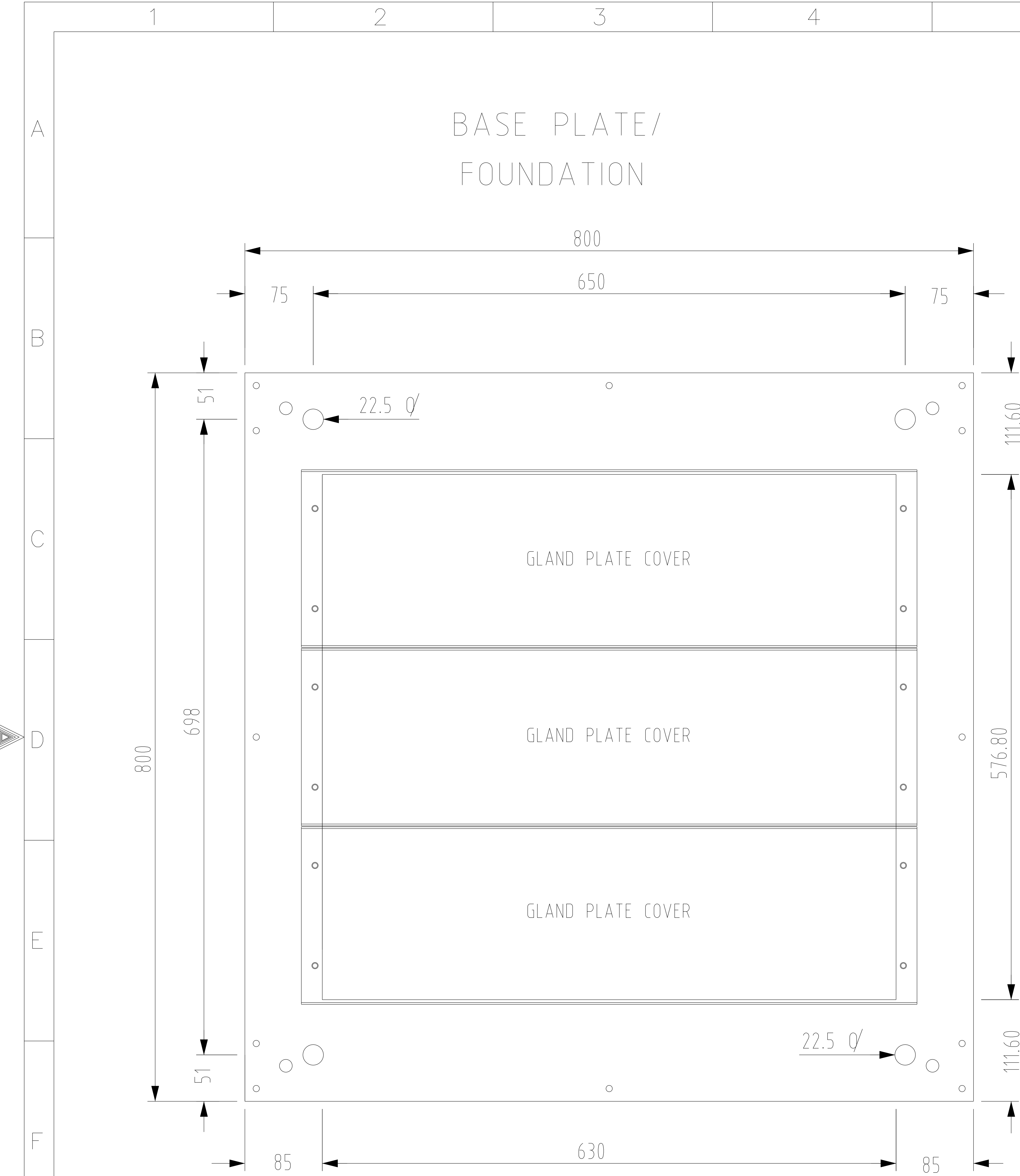
PLANE - B

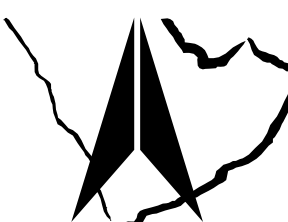
SCH.REF	DESCRIPTION	TYPE	MAKE
1X1.2X1	CT CIRCUITS	OTTA 6T P/P	PHOENIX
1X2.2X2	VT CIRCUITS	D6/8.ST1.RS	PHOENIX
X3	AC INCOMING CIRCUITS	D6/8.ST1.RS	ENTRELEC
1X4.2X4	DC INCOMING CIRCUITS	D6/8.ST1.RS	ENTRELEC

PLANE - C

SCH.REF	DESCRIPTION	TYPE	MAKE
X6	ALARM SUPPLY	M6/8.RS	ENTRELEC
X61	ALARM CIRCUITS	M6/8.SNB	ENTRELEC
X51,X51A	CONTROL CIRCUITS	M6/8.RS	ENTRELEC
X9	SPARE CIRCUITS	M6/8.RS	ENTRELEC
XTJ	TELEPHONE JACK	M6/8.RS	ENTRELEC
XSH	SPACE HEATER	M6/8.RS	ENTRELEC

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G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		ASSEMBLY DRAWING		<div>الشركة الوطنية لنقل الكهرباء</div> <div> <b>نقل الكهرباء</b> National Grid sa</div>						
	01	13 48	AS MANUFACTURED FOR APPROVAL		DRAWN BY <u>      RIZ      </u> CHECKED BY <u>      KVR      </u>		13.8kV CAPACITOR BANK-1 PROT. PANEL		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
	00	13 04			DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____		S/S 8709-132/13.8KV IN AL-KHARJ CITY		P	C421	CD-322951	SHT	CONT.	01	
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. <u>      CTPD      </u> ENG. DEPT. <u>      AUT-PSAC      </u>		RIYADH SAUDI ARABIA					G03	G04		



MANUFACTURING LABEL


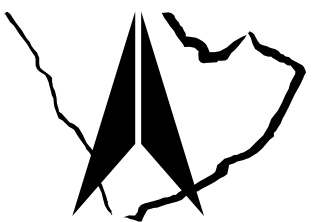
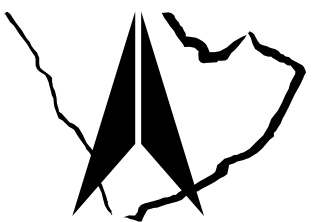
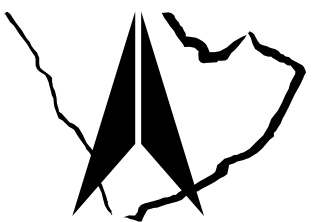
ABB Automation Co.Ltd.

PROJECT	:	National Grid SA S/S 8709
ORDER REFERENCE	:	2875 RF S13656
YEAR OF MANUFACTURE	:	2013
PANEL NO.	:	+CBP1
DRAWING NO.	:	S13656-CD-323952

MADE IN THE KINGDOM OF SAUDI ARABIA



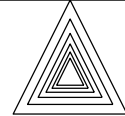
الشركة الوطنية لنقل الكهرباء

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							RIYADH SAUDI ARABIA																																																																					

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نقل الكهرباء  
National Grid sa

الشركة الوطنية لنقل الكهرباء

LIST OF APPARATUS  
13.8kv CAPACITOR BANK-1 PROT. PANEL  
S/S 8709-132/13.8KV IN AL-KHARJ CITY  
RIYADH SAUDI ARABIA

INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
P	C421	CD-322951	SHT L01	CONT. L02
				01

AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656	
01	13 48	AS MANUFACTURED	DRAWN BY RIZ CHECKED BY KVR			
00	13 04	FOR APPROVAL	DATE STARTED 24.01.2013 DATE COMPLETED _____			
REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC			

NG/D2-D (2012/01)

DMS

VECTOR

NGD200



	1	2	3	4	5	6	7	8	9	10			
A													
B	SR. NO.	LOCATION REF.	SCH REF.	D E S C R I P T I O N		SHT NO.	QTY.	TYPE	MAKE	ORDERING INFORMATION			
	3	U17.5001	TS-1	TEST SWITCH FOR GROUP-1 PROTECTION		213	1	RXTP24	ABB	RK 926 315-AG			
	4	U17.5002	TS-2	TEST SWITCH FOR GROUP-2 PROTECTION		214	1	RXTP24	ABB	RK 926 315-AK			
	5	U23.5001	86C-1	GROUP-1 LOCKOUT RELAY		218	1	MVAJ105	ALSTOM	MVAJ105RA0802A			
				AUX. VOLTAGE : 125V DC									
				CONTACTS : 8NO + 2NC									
				FLAG:STANDARD HAND RESET									
				CONTACT MECHANISM:HAND & ELECTRICAL RESET									
C	6	U23.5002	94-1	TRIP RELAY		218	1	MVAJ101	ALSTOM	MVAJ101RA0800A			
				AUX. VOLTAGE : 125V DC									
				CONTACTS : 10NO									
	7	U23.5003	86BF	BF LOCKOUT RELAY		220	1	MVAJ105	ALSTOM	MVAJ105RA0802A			
				AUX. VOLTAGE : 125V DC/TRIPPING RELAY-HIGH BURDEN									
				CONTACTS : 8NO + 2NC									
				FLAG:STANDARD HAND RESET									
				CONTACT MECHANISM:HAND & ELECTRICAL RESET									
D	8	U23.5004	86C-2	GROUP-2 LOCKOUT RELAY		220	1	MVAJ105	ALSTOM	MVAJ105RA0802A			
				AUX. VOLTAGE : 125V DC									
				CONTACTS : 8NO + 2NC									
				FLAG:STANDARD HAND RESET									
				CONTACT MECHANISM:HAND & ELECTRICAL RESET									
	9	U23.5005	94-2	TRIP RELAY		220	1	MVAJ101	ALSTOM	MVAJ101RA0800A			
				AUX. VOLTAGE : 125V DC									
				CONTACTS : 10NO									
E	10	U21.5001	PB11	PUSH BUTTON FOR RESETTING 86C-1 LOCKOUT RELAY		218	1	MP1-10B	ABB	1SFA 611 100 R1006			
				BUTTON COLOUR ;BLACK:CONTACT DATA:1NO+1NC				MCBH-20		1SFA 611 605 R1102			
	11	U21.5002	PB22	PUSH BUTTON FOR RESETTING 86BF LOCKOUT RELAY		220	1	MP1-10B	ABB	1SFA 611 100 R1006			
				BUTTON COLOUR ;BLACK:CONTACT DATA:1NO+1NC				MCBH-20		1SFA 611 605 R1102			
	12	U21.5003	PB21	PUSH BUTTON FOR RESETTING 86C-2 LOCKOUT RELAY		220	1	MP1-10B	ABB	1SFA 611 100 R1006			
				BUTTON COLOUR ;BLACK:CONTACT DATA:1NO+1NC			1	MCBH-20		1SFA 611 605 R1102			
	13	U27.301	74R1	DC SUPERVISION RELAY (REVERSE FLAG)		218	1	RXSF1	ABB	RK 271 019-AN			
			SPARE	AUX. VOLTAGE : 110-125V DC									
F				CONTACTS : 1NO + 2NC PER COIL									
				FLAG : SELF RESET									
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LIST OF APPARATUS		<div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div>				
	01	13 48	AS MANUFACTURED		DRAWN BY RIZ CHECKED BY KVR		13.8kV CAPACITOR BANK-1 PROT. PANEL						
	00	13 04	FOR APPROVAL		DATE STARTED 24.01.2013 DATE COMPLETED		S/S 8709-132/13.8KV IN AL-KHARJ CITY		INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA		P	C421	CD-322951	L02L03	01

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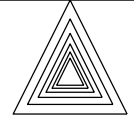
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B	SR. NO.	LOCATION REF.	SCH REF.	D E S C R I P T I O N		SHT NO.	QTY.	TYPE	MAKE	ORDERING INFORMATION
	14	U27.307	74R2	DC SUPERVISION RELAY		221	1	RXSF1	ABB	RK 271 019-AN
			SPARE	AUX. VOLTAGE : 110-125V DC						
				CONTACTS : 1NO + 2NC PER COIL						
C	15	U39.5001	Q1	MCB 2 POLE 6A, FOR DC SUPPLY WITH 2NC AUX. CONTACT R1 ± SUPPLY		216	2	S282 UC K6	ABB	GH S282 0164 R0317
		U39.5002	Q2	MCB 2 POLE 6A, FOR DC SUPPLY WITH 2NC AUX. CONTACT R2 ± SUPPLY				S2-H02		GH S270 1916 R0003
	16	U39.5003	C01,C02	CONVENIENCE OUTLET 10A, 127V, 220V AC		211	1	USM45 & USMS45	LEGRAND	74140 & 74180
	17		DS	DOOR SWITCH FOR CONTROL OF CUBICLE INTERNAL ILLUM. LAMP		211	1	LS30P, 13B02	ABB	1SBV 010 213R 1202
D	18		IL	INTERNAL ILLUMINATION CUBICLE LAMP SUITABLE FOR 127V 60HZ SUPPLY		211	1	T4	SUNON	SP-20W
	19		C1,C2	MINIATURE CIRCUIT BREAKER, 2 POLE, 10A FOR CONVENIENCE OUTLET		211	2	S202P-P10	ABB	2CDS 252 001 R0427
				WITH AUXILIARY SWITCH, 1NO + 1NC CONTACTS				S2C-H11L		GH S270 1917 R0001
	20		SH	SPACE HEATER, 150W, 120V, 60Hz		211	1	RICA	GRUPPO	1FZEK006C001
E	21		C3	THERMOSTAT FOR SPACE HEATER, 5-60°C		211	1	SK 3110	RITTAL	SK 3110
	22		C7	ON/OFF SWITCH FOR SPACE HEATER		211	1	M2SS1-10B	ABB	1SFA 611 200 R1006
								MCBH-10		1SFA 611 605 R1101
	23	U39.5004	TJ	TELE PHONE JACK IGANG 4WIRE		211	1	EDF410	EDISON	EDF410
F										
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LIST OF APPARATUS		الشركة الوطنية لنقل الكهرباء National Grid sa	
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	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA			

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A		SR. NO.	LOCATION REF.	SCH. REF.	D E S C R I P T I O N		SHT NO.	QTY.	TYPE	MAKE	ORDERING INFORMATION
		24		1X1	BOLT CONNECTING TERMINAL BLOCK DISCONNECTABLE FOR CT CIRCUIT		605	15	OTTA6T-P/P	PHOENIX	0790462
				2X1			605	15			
B		25		1X2	SPRING LOADED TERMINAL BLOCK DISCONNECTABLE FOR PT SUPPLY		605	10	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400
				2X2			605	5			
		26		X3	SPRING LOADED TERMINAL BLOCKS FOR AC SUPPLY		605	10	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400
		27		1X4	SPRING LOADED TERMINAL BLOCK FOR DC CIRCUIT		605	10	D6/8.ST1.RS	ENTRELEC	1SNA 115 831 R0400
				2X4			605	10			
C		28		1X5	SPRING LOADED TERMINAL BLOCK FOR CONTROL CIRCUIT		605	25	M6/8.RS	ENTRELEC	1SNA 115 685 R1200
				2X5			605	25			
		29		X5	SPRING LOADED TERMINAL BLOCK FOR CONTROL CIRCUIT		605	5	M6/8.RS	ENTRELEC	1SNA 115 685 R1200
		30		X61	SRING LOADED TERMINAL BLOCK FOR STN.-COM ALARM PANEL		604	10	M6/8 SNB	ENTRELEC	1SNA 115 688 R2500
		31		XSH	SPRING LOADED TERMINAL BLOCK FOR SPACE HEATER		605	2	M6/8.RS	ENTRELEC	1SNA 115 688 R2500
D		32		XTJ	SPRING LOADED TERMINAL BLOCK FOR TELEPHONE JACK		605	4	M6/8.RS	ENTRELEC	ISNA 115 685 R1200
		33		X9	SPRING LOADED TERMINAL BLOCK FOR SPARE CONTACT		605	10	M6/8.RS	ENTRELEC	ISNA 115 685 R1200
		34		X6	SPRING LOADED TERMINAL FOR ALARM		605	5	M6/8.RS	ENTRELEC	1SNA 115 688 R2500
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G	AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		الشركة الوطنية لنقل الكهرباء National Grid sa			
				DRAWN BY RIZ CHECKED BY KVR		LIST OF APPARATUS					
	01	13 48	AS MANUFACTURED	DATE STARTED 24.01.2013 DATE COMPLETED _____		13.8kv CAPACITOR BANK-1 PROT. PANEL		INDEX P PLANT NO. C421 DRAWING NUMBER CD-322951 SHEET NO. SHT CONT. L04L05 REV. NO. 01			
	00	13 04	FOR APPROVAL			S/S 8709-132/13.8KV IN AL-KHARJ CITY					
	REV. NO.	DATE	DESCRIPTION	OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA					

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	01	13 48	AS MANUFACTURED		DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u>		13.8kV CAPACITOR BANK-1 PROT. PANEL						
	00	13 04	FOR APPROVAL		DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____		S/S 8709-132/13.8KV IN AL-KHARJ CITY		INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>		RIYADH SAUDI ARABIA		P	C421	CD-322951	SHT <u>L05</u> CONT. <u>L06</u>	01

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	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA			

LABEL REF.	LABEL ENGRAVING	MATERIALS	ENGRAVING	LABEL SIZE	LETTER SIZE
C1	C1 127V AC SUPPLY MCB	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C2	C2 220V AC SUPPLY MCB	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C3	C3 THERMOSTAT	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
C7	C7 ON/OFF SWITCH	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
DS	DS DOOR SWITCH	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
IL	IL ILLUMINATION LAMP	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm
SH	SH SPACE HEATER	TRAFOLITE	BLACK LETTERS ON WHITE BACKGROUND	50X15mm	4mm



الشركة الوطنية لنقل الكهرباء

National Grid sa


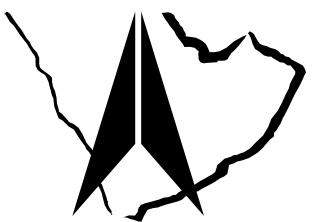
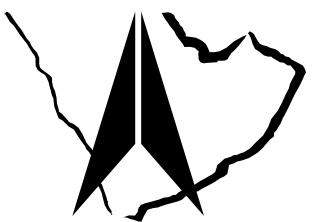
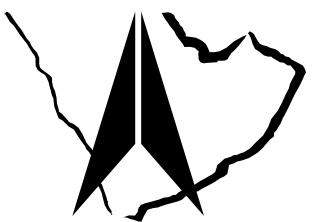
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.	REV. NO.
P	C421	CD-322951	SHT L06	CONT. NIL
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A			POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656					ABB AUTOMATION COMPANY LTD., 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A																																																													
B																																																																					
C	CONTRACTOR : ABB Contracting Company																																																																				
	CLIENT : National Grid sa																																																																				
D	PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY																																																																				
	SUBSTATION : S/S 8709																																																																				
E	CONTRACT NO. : 11131113/00																																																																				
	TITLE : SCHEMATICS DRAWINGS +CBP1 (SHUNT CAPACITOR BANK-1)																																																																				
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G	<table><tr><td colspan="3">AS-BUILT BY _____ DATE _____</td><td colspan="2">CONTRACT NO. 11131113/00</td><td colspan="2">JOB ORDER NO. S-13656</td><td colspan="3">COVER SHEET</td><td colspan="2"> <b>نقل الكهرباء</b> الشركة الوطنية لنقل الكهرباء National Grid sa</td></tr><tr><td></td><td></td><td></td><td colspan="3">DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u></td><td colspan="3">13.8kV CAPACITOR BANK-1 PROT. PANEL</td><td colspan="2"></td></tr><tr><td>01</td><td>13 48</td><td colspan="2">AS MANUFACTURED</td><td colspan="3">DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____</td><td colspan="3">S/S 8709-132/13.8KV IN AL-KHARJ CITY</td><td colspan="2"></td></tr><tr><td>00</td><td>13 04</td><td colspan="2">FOR APPROVAL</td><td colspan="3">OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u></td><td colspan="3">RIYADH SAUDI ARABIA</td><td colspan="2"></td></tr><tr><td>REV. NO.</td><td>DATE</td><td colspan="2">DESCRIPTION</td><td colspan="3"></td><td colspan="3"></td><td colspan="2"></td></tr></table>										AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COVER SHEET			 <b>نقل الكهرباء</b> الشركة الوطنية لنقل الكهرباء National Grid sa					DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u>			13.8kV CAPACITOR BANK-1 PROT. PANEL					01	13 48	AS MANUFACTURED		DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____			S/S 8709-132/13.8KV IN AL-KHARJ CITY					00	13 04	FOR APPROVAL		OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>			RIYADH SAUDI ARABIA					REV. NO.	DATE	DESCRIPTION									
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SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	FRAME CONNECTION		MAIN CONTACT OF A CIRCUIT BREAKER		RELAY WITH TWO MAKE CONTACTS, ONE OF THEM DELAYED WHEN OPERATING
	EARTH CONNECTION		PASSING MAKE CONTACT CLOSING MOMENTARILY DURING OPERATION AND RELEASE		RELAY WITH TWO ACTUATORS AND A TWO STABLE POSITIONS
	RESISTOR		BREAK CONTACT DELAYED WHEN OPERATING		SIGNALLING LAMP
	VARIABLE RESISTOR		MAKE CONTACT DELAYED WHEN RELEASING		MECHANICAL INDICATOR WITH AUTOMATIC RESET
	RESISTOR WITH PRESET ADJUSTMENT		TWO MECHANICAL LINKS CROSSING WITHOUT CONNECTION		MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET
	CAPACITOR		JUNCTION OF MECHANICAL LINKS		ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH AUTOMATIC RESET
	SEMICONDUCTOR DIODE USED AS A CAPACITIVE DEVICE		AUTOMATIC RESET		ELECTRICALLY CONTROLLED MECHANICAL INDICATOR WITH NON-AUTOMATIC RESET
	OPEN CONTACT, MAKE CONTACT		NON-AUTOMATIC RESET		RELAY WITH MAKE CONTACT
	CLOSED CONTACT, BREAK CONTACT		SWITCHING DEVICE WITH MANUAL OPERATION AND WITH AUTOMATIC RESET		RELAY WITH CHANGE-OVER CONTACT
	CHANGE-OVER CONTACT, BREAK BEFORE MAKE		SWITCHING DEVICE WITH MANUAL OPERATION AND WITH NON-AUTOMATIC RESET		ELECTRO-MECHANICAL POSITION INDICATOR WITH ONE DE-ENERGIZED AND ONE OPERATED POSITION
	MAKE CONTACT WHICH IS EARLY WHEN OPERATING AND LATE WHEN RELEASING		CHANGE-OVER SWITCHING DEVICE WITH MANUAL CONTROL AUTOMATIC RESET FROM POSITION 1-2 TO THE NEUTRAL POSITION		ELECTRO-MECHANICAL POSITION INDICATOR WITH ONE DE-ENERGIZED AND TWO OPERATED POSITION
	BREAK CONTACT WHICH IS LATE WHEN OPERATING AND EARLY WHEN RELEASING		RELAY WITH MAKE CONTACT		BELL, BUZZER
	SWITCHING DEVICE WITH MANUAL CONTROL		RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING		SIREN , HORN
	MAKE CONTACT DELAYED WHEN OPERATING		RELAY WITH MAKE CONTACT, DELAYED WHEN RELEASING		
	BREAK CONTACT DELAYED WHEN RELEASING		RELAY WITH MAKE CONTACT, DELAYED WHEN OPERATING AND RELEASING		
	MAKE CONTACT DELAYED WHEN OPERATING AND RELEASING				
	MAIN CONTACT OF A SWITCH DISCONNECTOR				
	MAIN CONTACT OF A DISCONNECTOR				

AS-BUILT BY \_\_\_\_\_ DATE \_\_\_\_\_

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

GRAPHICAL SYMBOLS FOR DIAGRAMS

13.8kV CAPACITOR BANK-1 PROT.PANEL

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH

SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

National Grid sa

INDEX

PLANT NO.

DRAWING NUMBER

SHEET NO.

REV. NO.

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CD-322952

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DRAWN BY RIZ

CHECKED BY KVR

DATE STARTED 24.01.2013

DATE COMPLETED

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FOR APPROVAL

OPRG. DEPT. CTPD

ENG. DEPT. AUT-PSAC

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LEGENDS

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RO

DC SUPPLY - MAIN PROTECTION

DC SUPPLY - SECONDARY PROTECTION

DC SUPPLY - BACK UP PROTECTION

DC SUPPLY - INTER TRIP

DC SUPPLY - FLASHING CIRCUIT

DC SUPPLY - BUS BAR - PROTECTION RESET

DC SUPPLY - CBF PROTECTION

RESET BUS - ALARM SYSTEM

CONTROL ROOM

ENERGY CONTROL CENTRE

THE LOCATION OF CONTROLLED DEVICE

ANY OTHER LOCATION NOT LOCAL

CB NORMALLY OPEN AUXILIARY CONTACT

CB NORMALLY CLOSED AUXILIARY CONTACT

COMMON

TEST POSITION

SERVICE POSITION

CLOSE IN SERVICE POSITION

CLOSE IN TEST POSITION

LOCAL SERVICE

LOCAL TEST

LOCAL CLOSE

LOCAL OPEN

REMOTE OPEN

NOTES

LABELS

LUGS

FERULLING

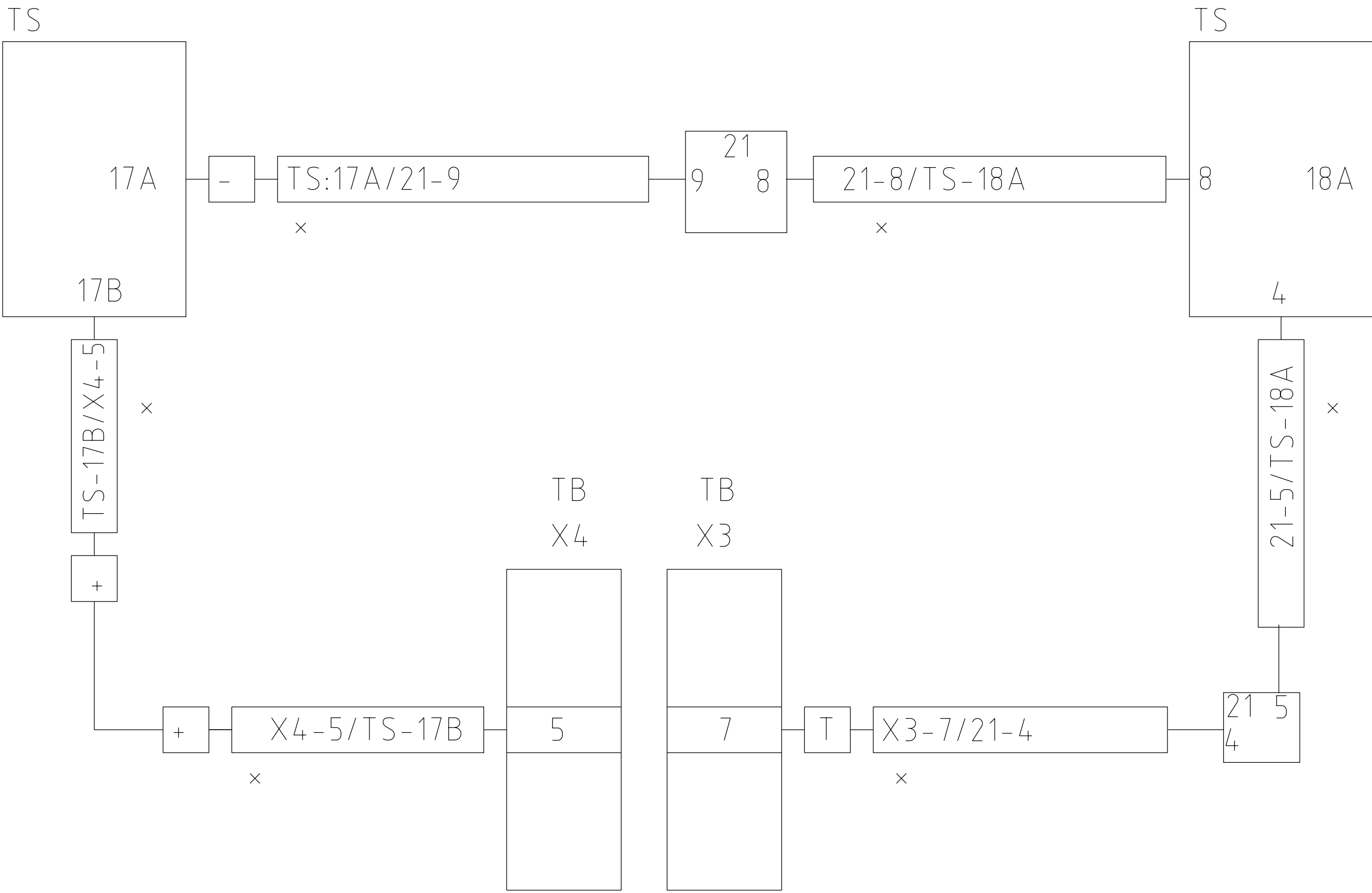
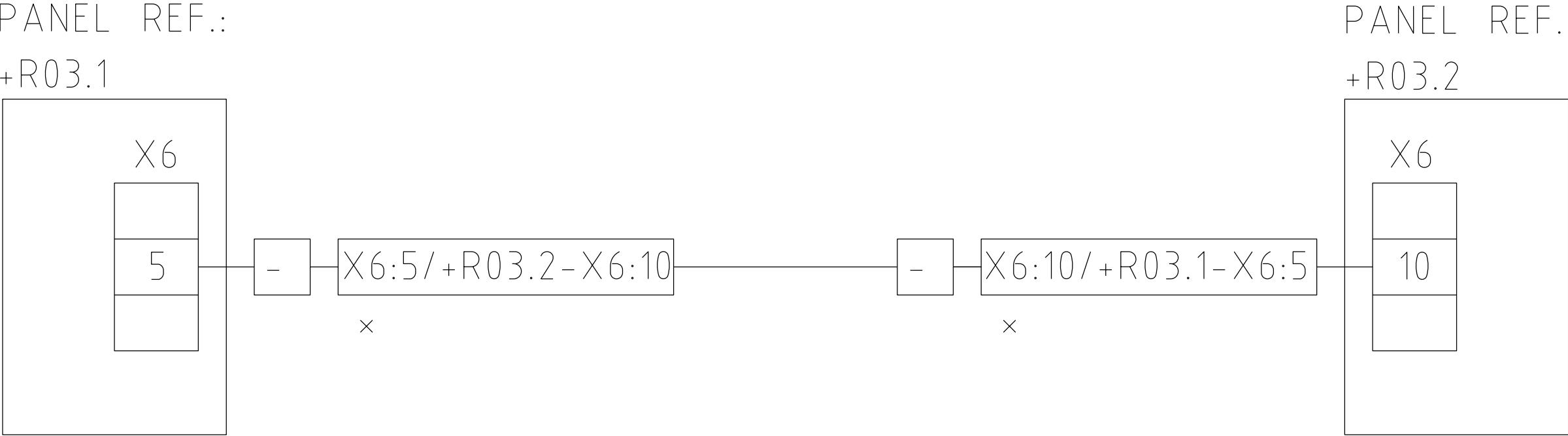
WHITE LABEL WITH BLACK LETTERING WILL BE PROVIDED FOR ALL MOUNTED APPARATUS EQUIPMENT IDENTIFICATION AND FUNCTION REFERENCE LABEL WILL BE PROVIDED FOR FRONT MOUNTED EQUIPMENTS OF THE PANEL AND EQUIPMENT IDENTIFICATION LABEL WILL BE PROVIDED FOR INTERNALLY MOUNTED EQUIPMENTS

A. CT CIRCUITS- RING TYPE  
B. OTHER CIRCUITS - SPADE TYPE

YELLO TUBE 3.2 mm FOR 1.5SQ mm WIRES AND 4.2 FOR 2.5 SQ mm WIRES ( AS PER 31 - TMSS-1, RE.0 )

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G	AS-BUILT BY _____ DATE _____				CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		FERRULE AND WIRING DETAILS	
	01	13 48	AS MANUFACTURED		DRAWN BY RIZ		CHECKED BY KVR		13.8kV CAPACITOR BANK-1 PROT. PANEL	
	00	13 04	FOR APPROVAL		DATE STARTED 24.01.2013		DATE COMPLETED _____		S/S 8709-132/13.8KV IN AL-KHARJ CITY	
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA	

FOR 132kV RELAY & CONTROL, PROTN. PANELS									
									
AS PER IEC-391 FIG 14a (W/O SUPPLEMENTARY/IDENTIFICATION MARK)									
FOR 132kV PANELS INTERPANEL WIRING									
					WIRES - PVC insulated, stranded, coaled annealed copper conductor graded for 1000V				
AS PER IEC-391 FIG 14d (W/O SUPPLEMENTARY/IDENTIFICATION MARK)					LUGS - Pre-Insulated				
					a. CT Circuits - 2.5 Sqmm PVC Yellow colour				
					b. VT Circuits - 1.5 Sqmm PVC Red colour				
					c. DC, & CONTROL Circuits - 1.5 Sqmm PVC Grey colour				
					d. Alarm Circuits - 1.0 Sqmm PVC Blue colour				
					e. AVC & AC Circuits - 2.5 Sqmm PVC Black colour				
					f. Earth Circuits - 2.5 Sqmm PVC Yellow/Green colour				
					a( CT Circuits - Ring type				
					b( Other Circuits - Spade type				

NOTE:1 ADDITIONAL MARKING AS APPLICABLE

NOTE:2 FERRULE NUMBERING WILL BE BLACK LETTERS ON YELLOW TUBE

3.2 mm for 1.5 sq mm wires and

4.2 mm for 2.5 sq mm wires

( As per 31-TMSS-1, REV 0 )

NOTE:3 STARTING POINT OF THE FERRULE LEFT TO RIGHT

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AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00			JOB ORDER NO. S-13656			DRAWING REFERENCES			<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء National Grid sa</div>				
			DRAWN BY <u>      RIZ      </u> CHECKED BY <u>      KVR      </u>			13.8kV CAPACITOR BANK-1 PROT. PANEL										
01	13 48	AS MANUFACTURED	DATE STARTED <u>24.01.2013</u> DATE COMPLETED _____			S/S 8709-132/13.8KV IN AL-KHARJ CITY			INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.	
00	13 04	FOR APPROVAL	OPRG. DEPT. <u>      CTPD      </u> ENG. DEPT. <u>      AUT-PSAC      </u>			RIYADH SAUDI ARABIA			-	C421	CD-322952		SHT	CONT.	01	
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PROTECTION & SUBSTATION  
AUTOMATION

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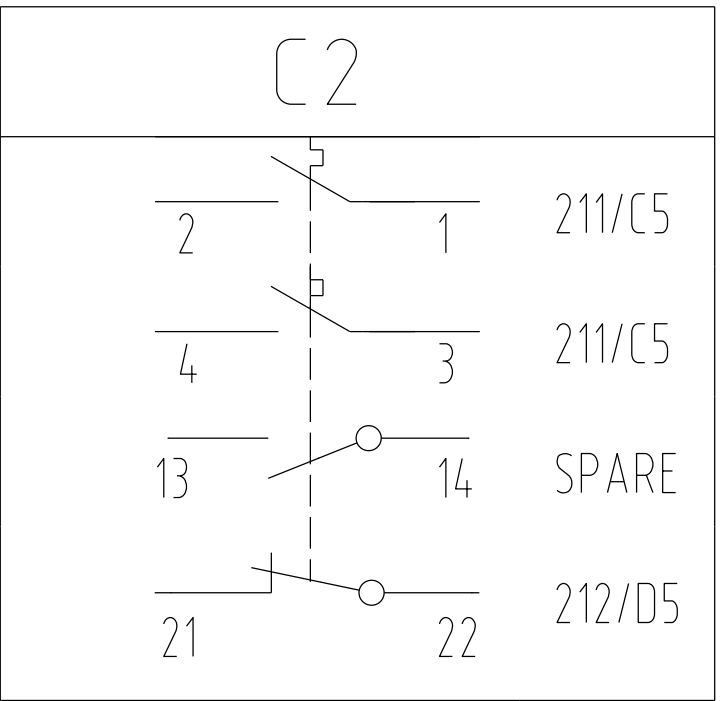
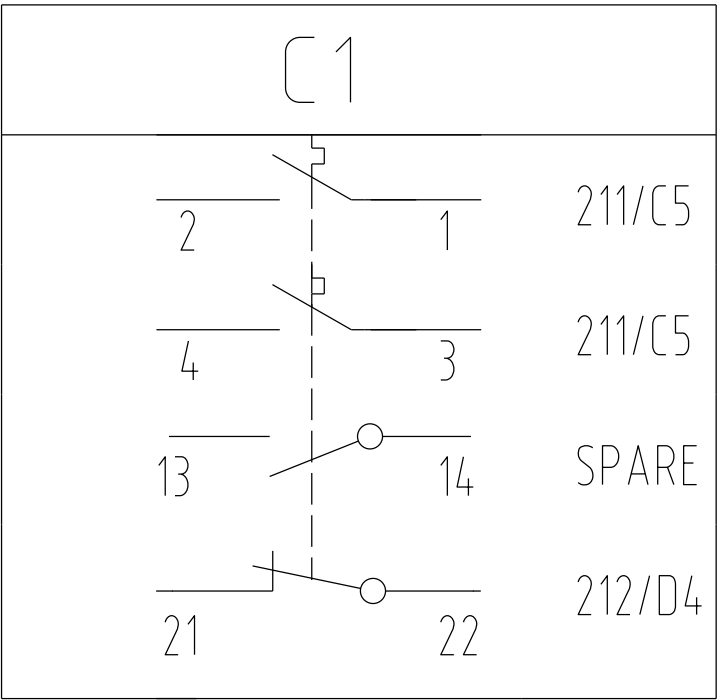
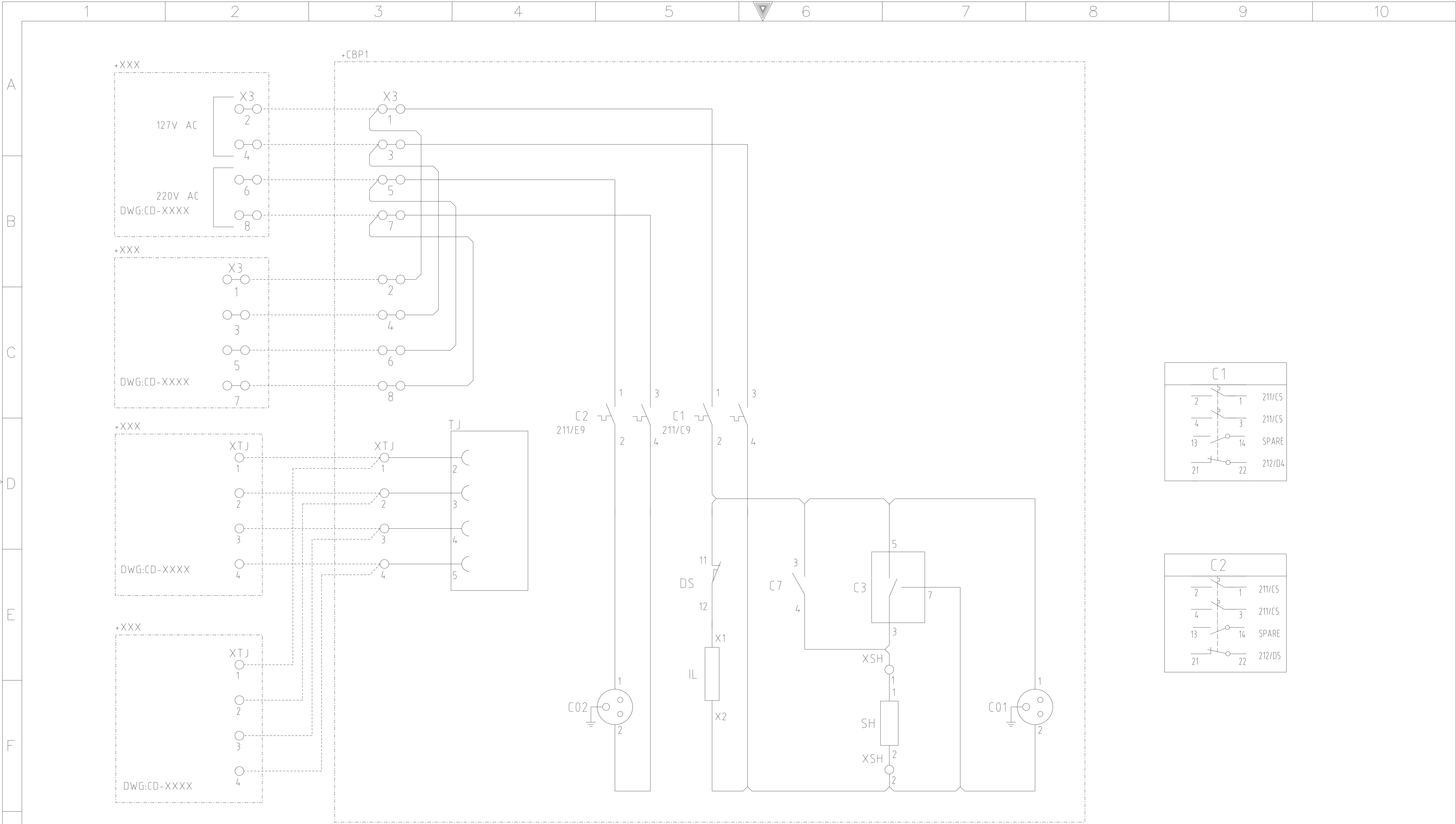


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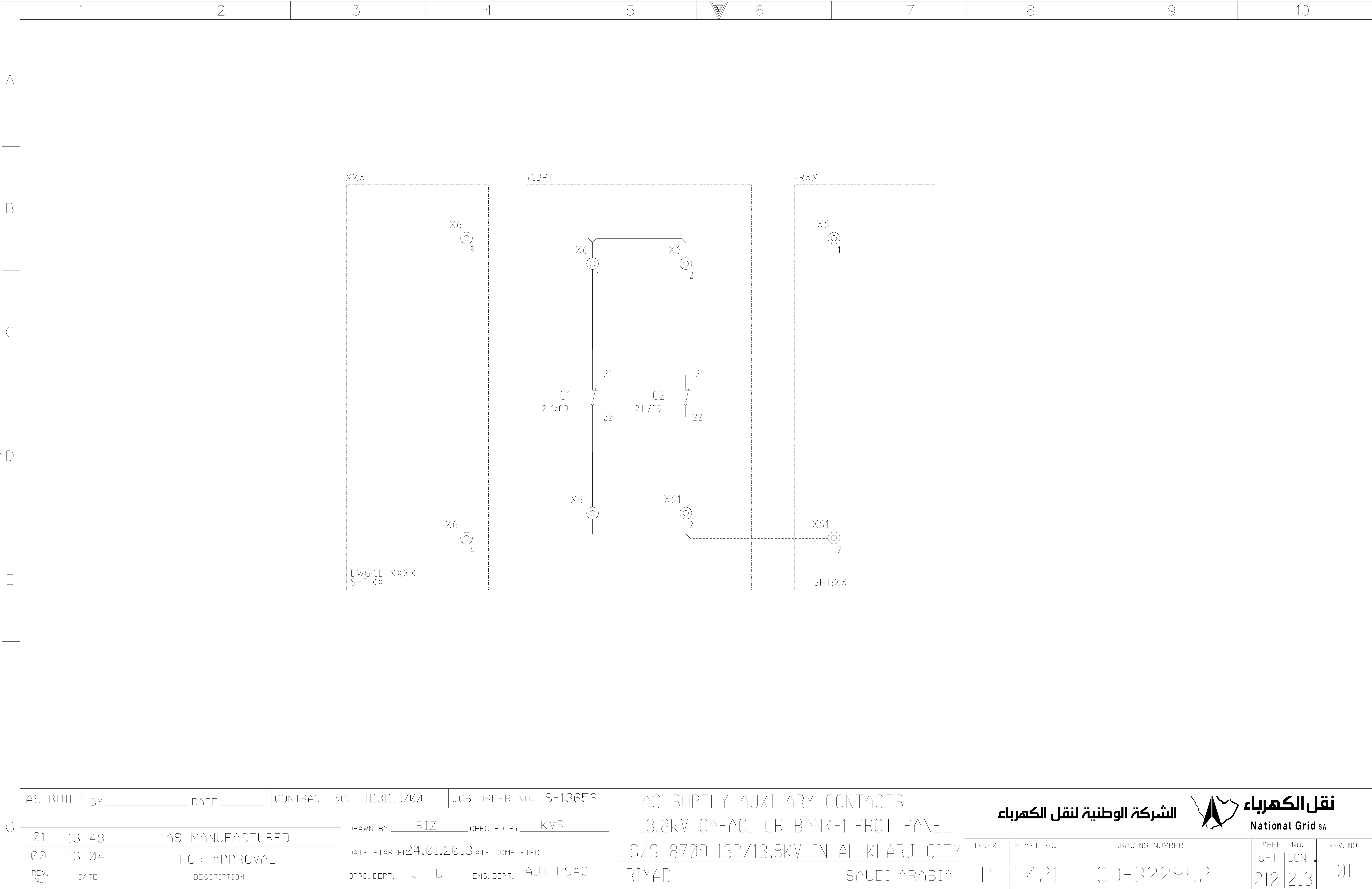
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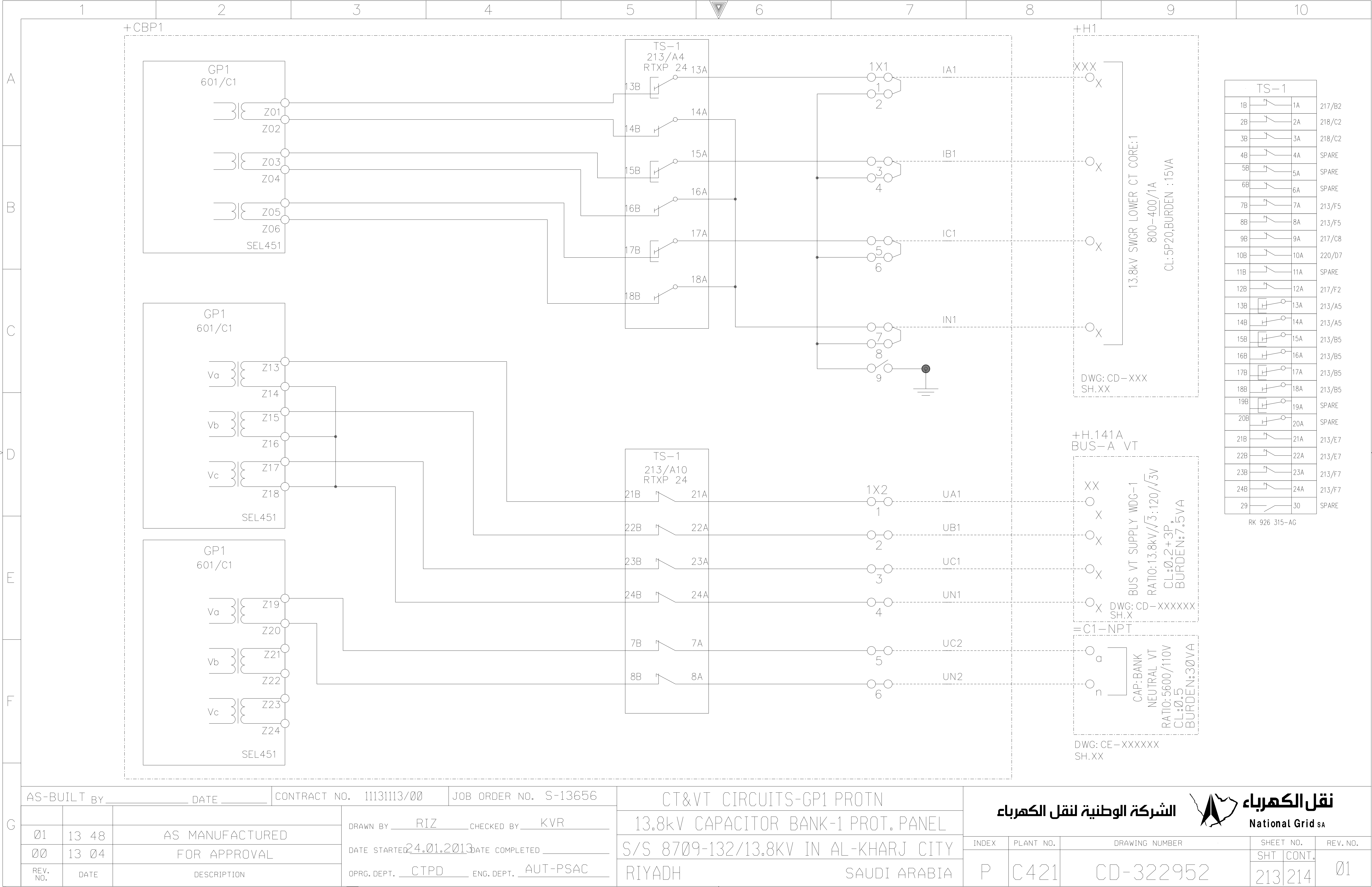
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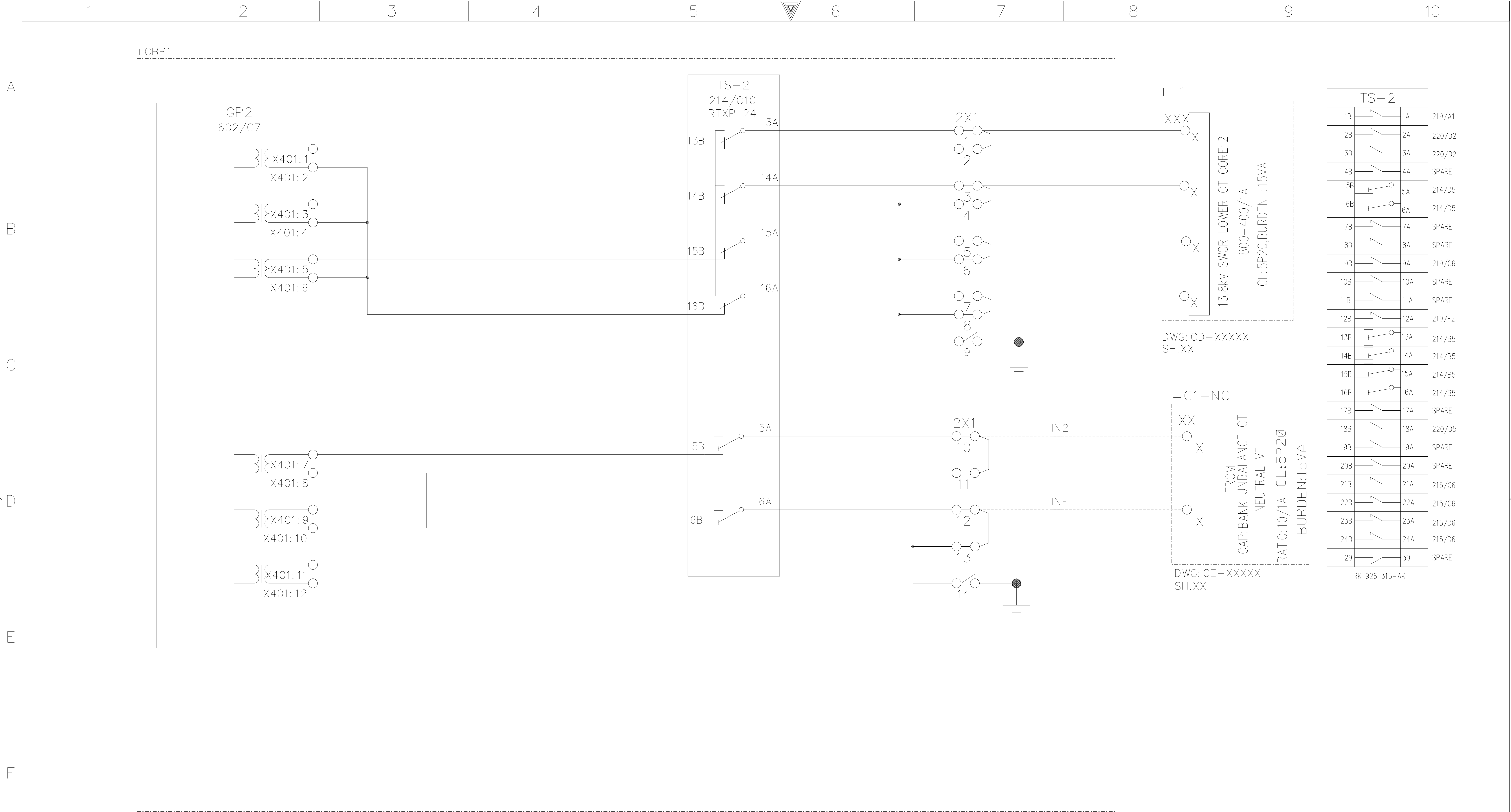


G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		AC SUPPLY FOR ILLUMINATION & POWER SOCKET		<div>نقل الكهرباء</div> <div>الشركة الوطنية لنقل الكهرباء</div> <div>National Grid sa</div>					
				DRAWN BY _____ RIZ _____ CHECKED BY _____ KVR _____		13.8kV CAPACITOR BANK-1 PROT.PANEL								
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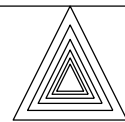
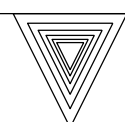
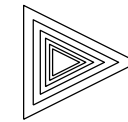
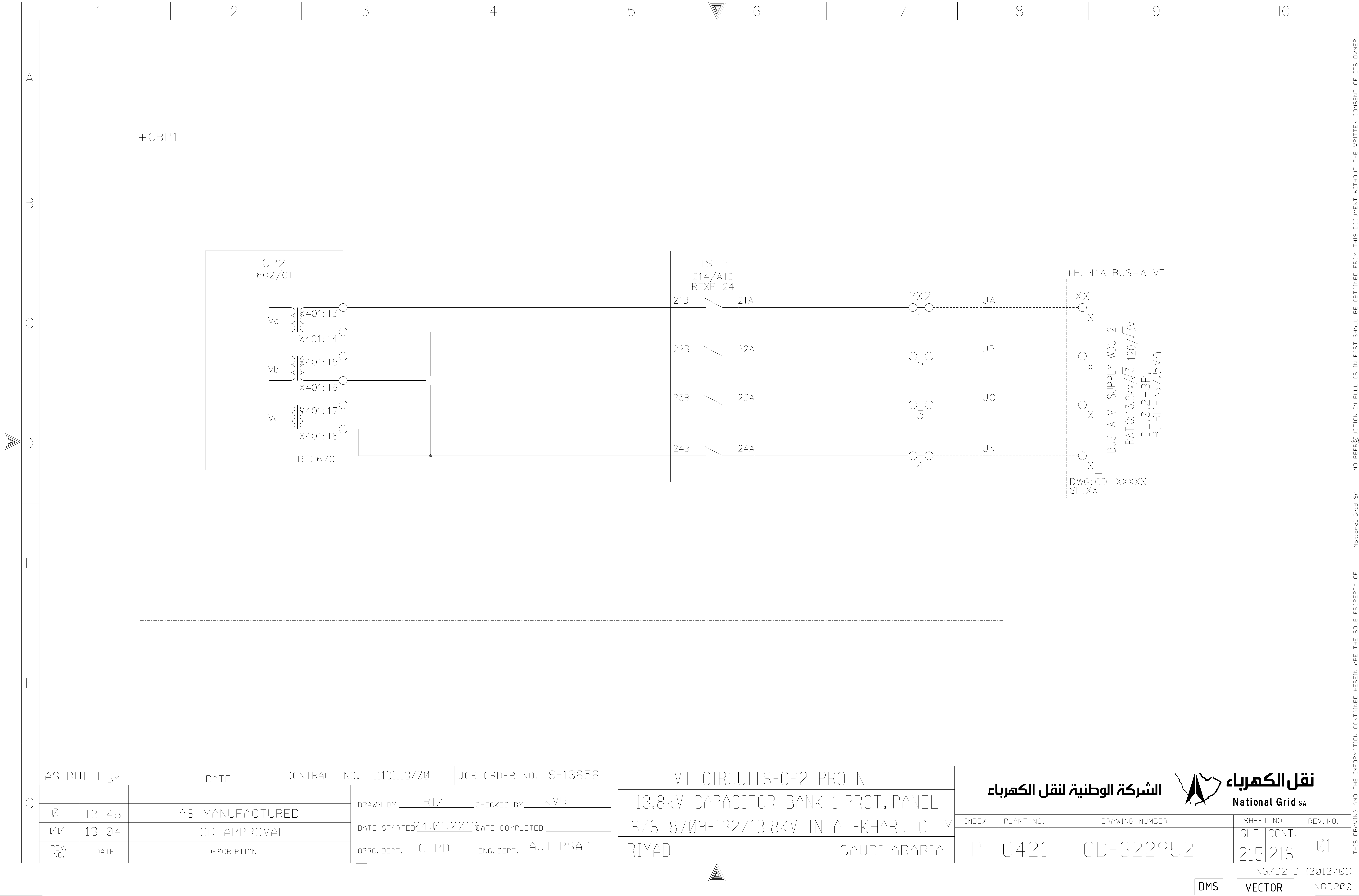


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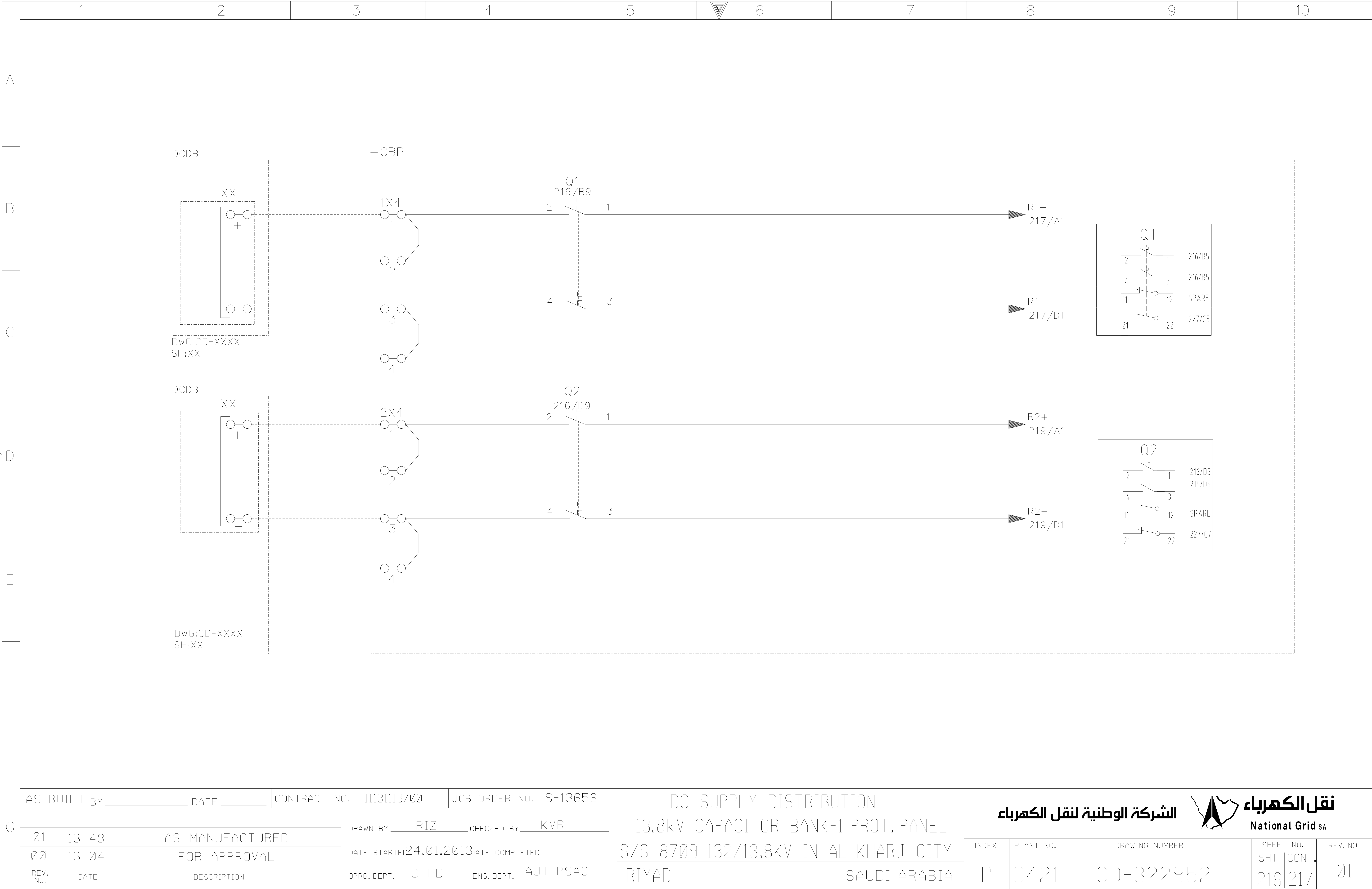
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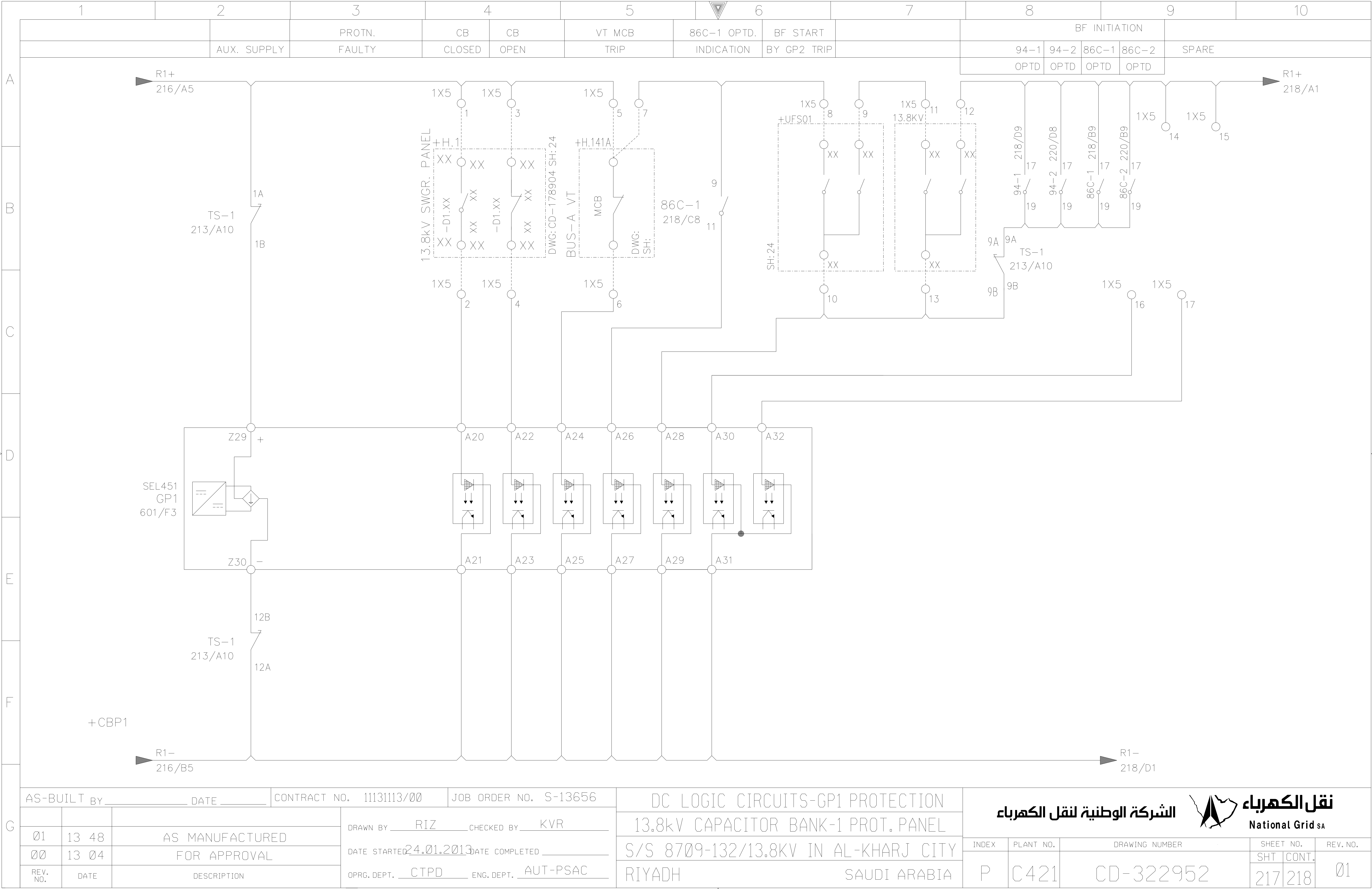
CT CIRCUITS-GP2 PROTN					
13.8kV CAPACITOR BANK-1 PROT. PANEL					
S/S 8709-132/13.8KV IN AL-KHARJ CITY					
RIYADH SAUDI ARABIA					

الشركة الوطنية لنقل الكهرباء				نقل الكهرباء	
				National Grid sa	
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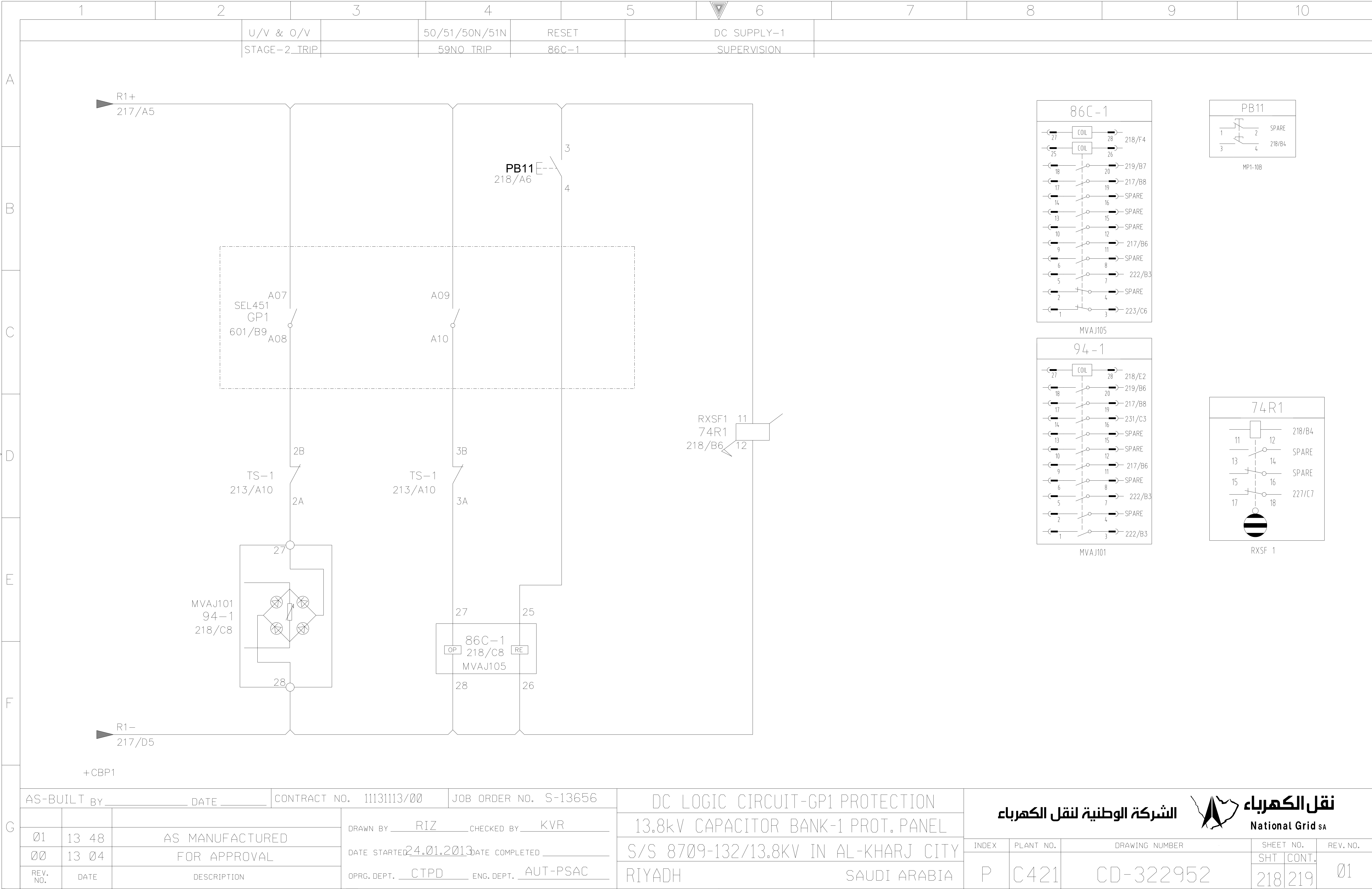


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CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

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DATE

DESCRIPTION

DRAWN BY RIZ

CHECKED BY KVR

DATE STARTED 24.01.2013

DATE COMPLETED

OPRG. DEPT. CTPD

ENG. DEPT. AUT-PSAC

DC LOGIC CIRCUIT-GP1 PROTECTION

13.8kV CAPACITOR BANK-1 PROT. PANEL

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

National Grid sa

INDEX

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DRAWING NUMBER

SHEET NO.

REV. NO.

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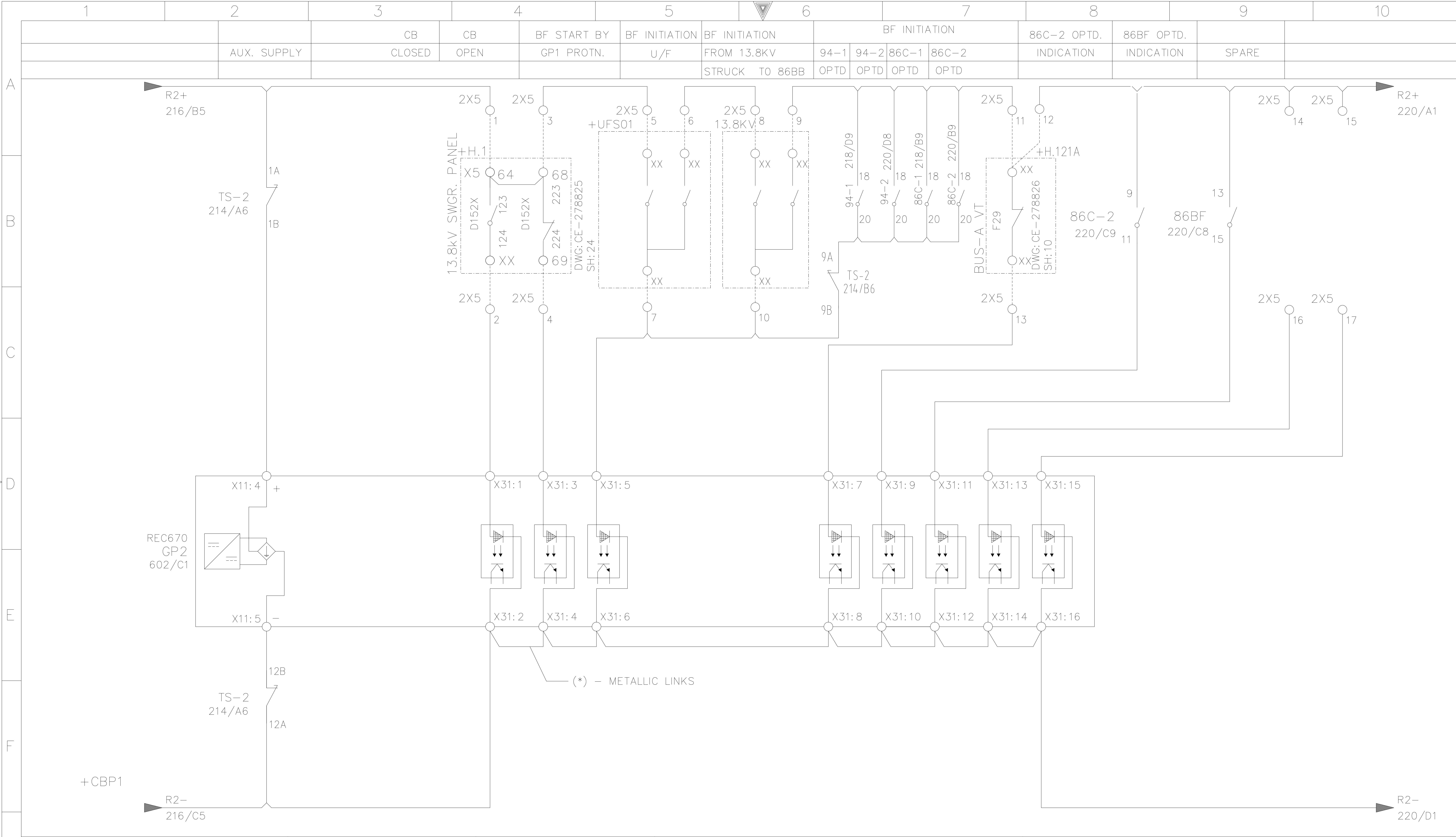
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NGD200

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G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		DC LOGIC CIRCUITS-GP2 PROTECTION		<div><div>الشركة الوطنية لنقل الكهرباء</div><div>نقل الكهرباء</div><div>National Grid sa</div></div>				
	01	13 48	AS MANUFACTURED		DRAWN BY RIZ CHECKED BY KVR		13.8kV CAPACITOR BANK-1 PROT. PANEL						
	00	13 04	FOR APPROVAL		DATE STARTED 24.01.2013 DATE COMPLETED _____		S/S 8709-132/13.8KV IN AL-KHARJ CITY						
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA						
INDEX		PLANT NO.		DRAWING NUMBER		SHEET NO.		REV. NO.					
P		C421		CD-322952		SHT 219 CONT. 220		01					







R2+  
220/A5

R2-  
220/D5

+CBP1

RXSF1  
74R2  
221/A6

11

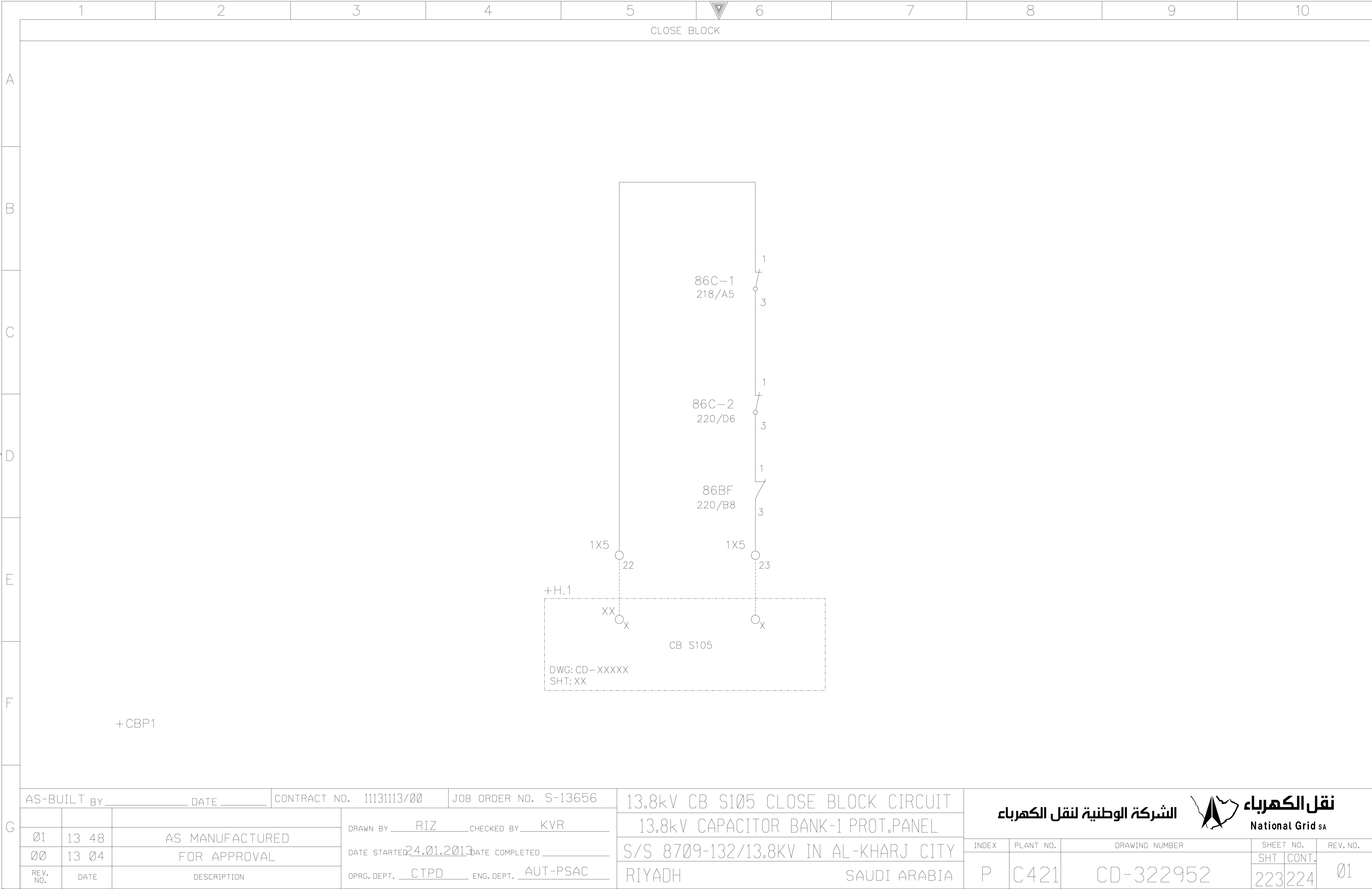
12

74R2			
11		12	221/B3
13		14	SPARE
15		16	SPARE
17		18	227/B6 ALARM TO STN. COMM
21		22	SPARE
23		24	SPARE
25		26	SPARE
27		28	SPARE

(RXSF1) AS PER B/C

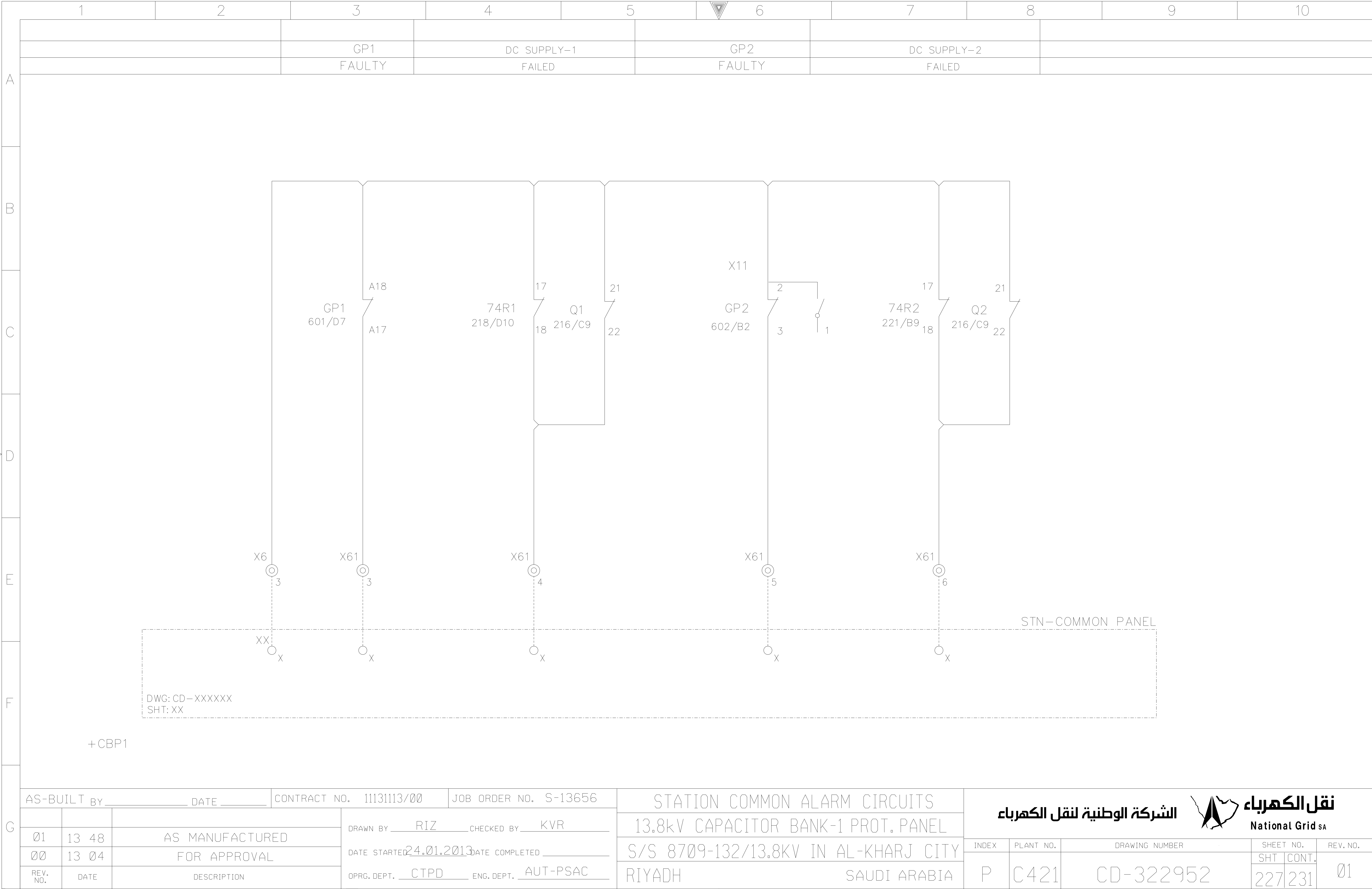
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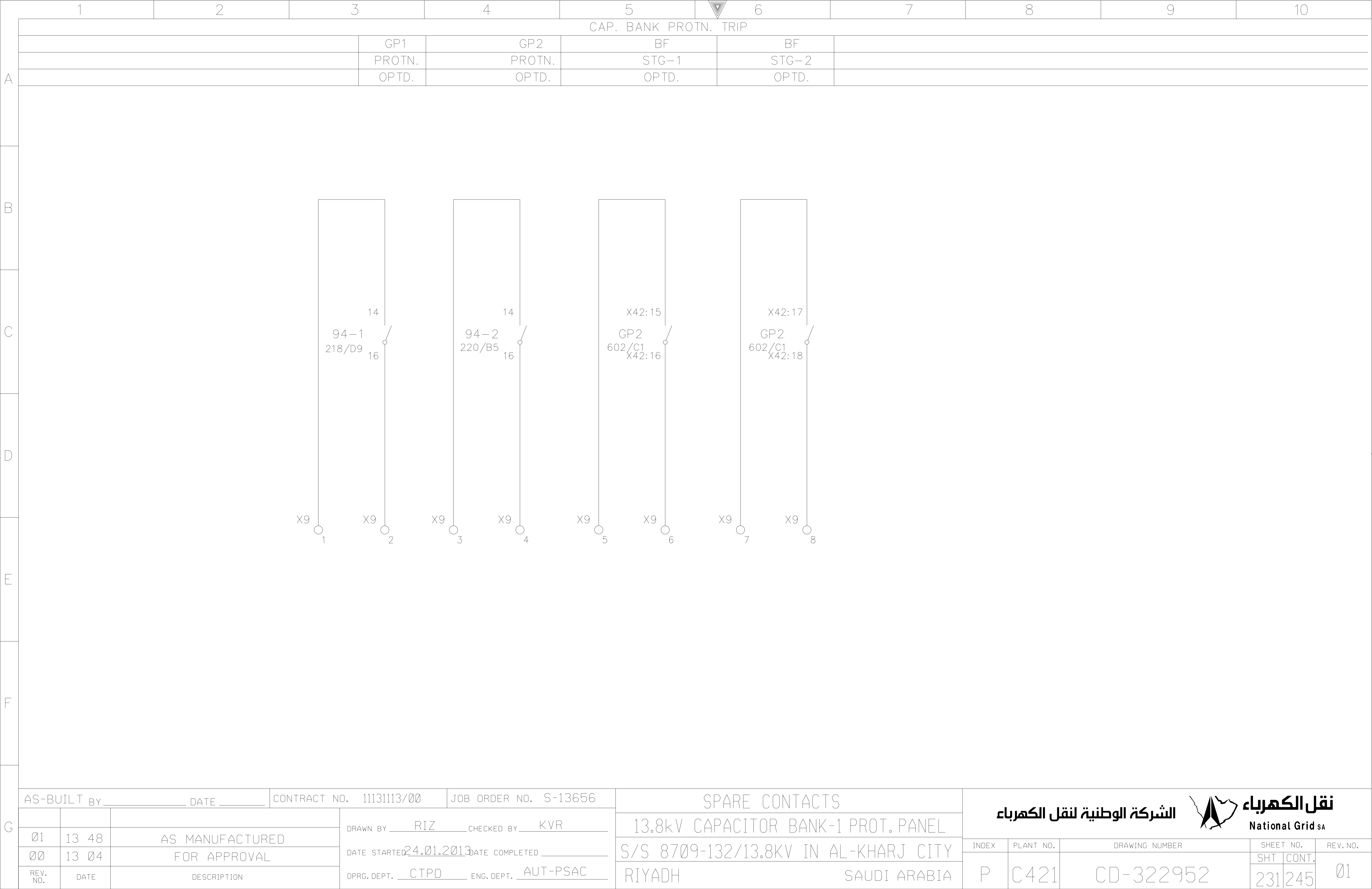




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AS-BUILT BY \_\_\_\_\_ DATE \_\_\_\_\_

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

SPARE CONTACTS

01

13 48

AS MANUFACTURED

00

13 04

FOR APPROVAL

REV. NO.

DATE

DESCRIPTION

DRAWN BY RIZ

CHECKED BY KVR

DATE STARTED 24.01.2013

DATE COMPLETED \_\_\_\_\_

OPRG. DEPT. CTPD

ENG. DEPT. AUT-PSAC

S/S 8709-132/13.8KV IN AL-KHARJ CITY

SAUDI ARABIA

INDEX

PLANT NO.

DRAWING NUMBER

SHEET NO.

REV. NO.

P

C421

CD-322952

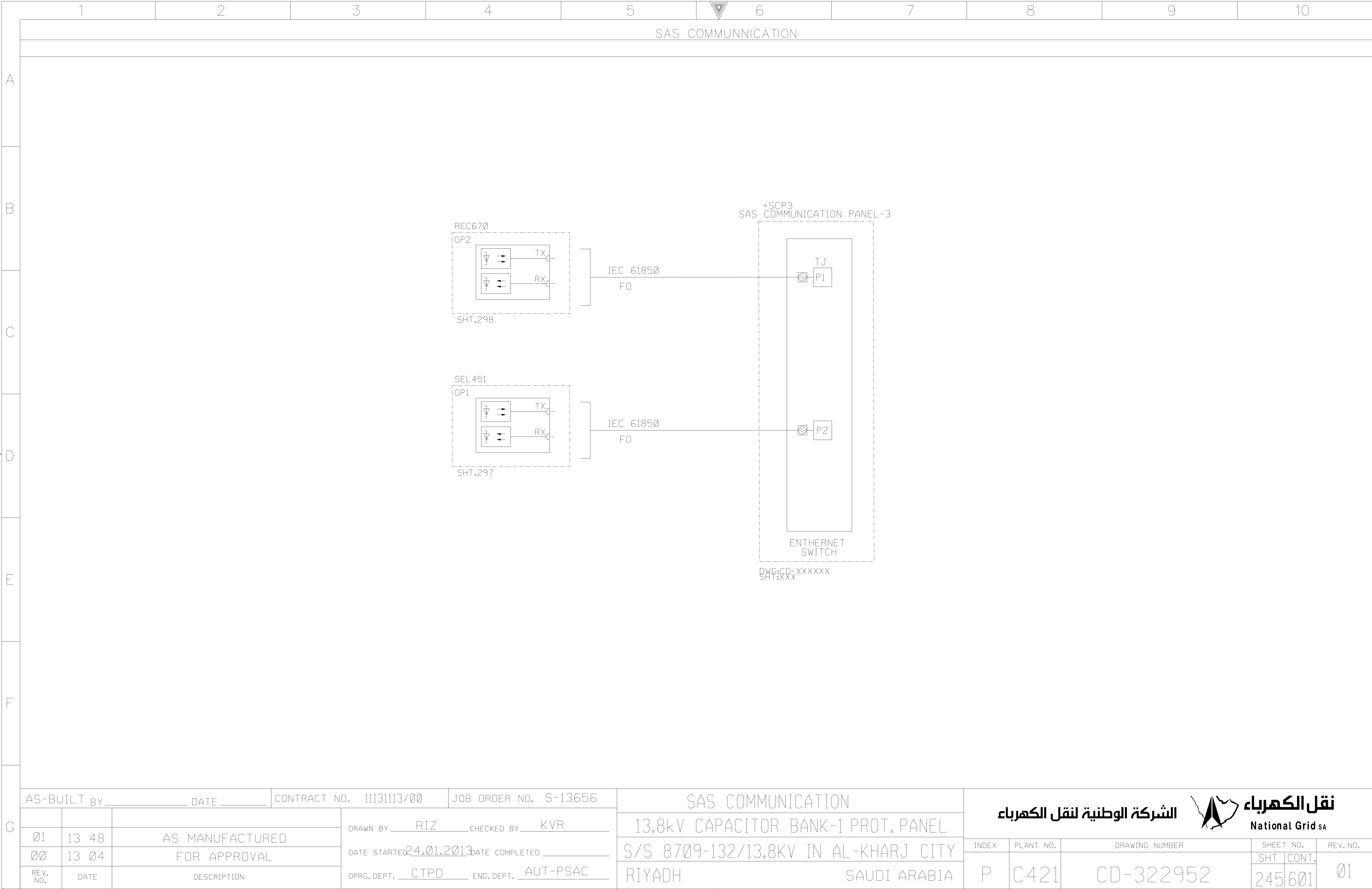
231

245

01

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الشركة الوطنية لنقل الكهرباء

National Grid sa

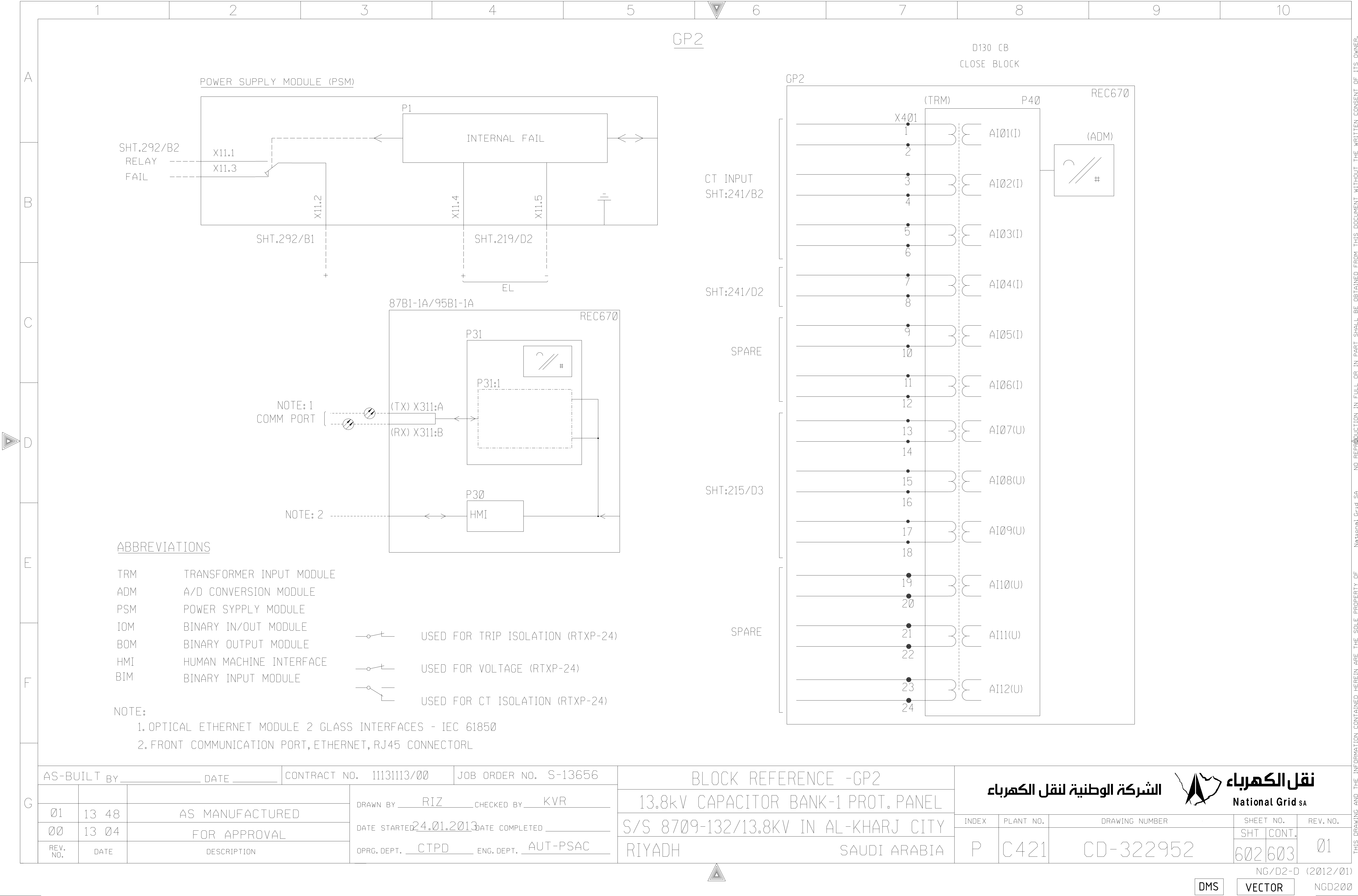
DMS

VECTOR

NGD200

NG/D2-D (2012/01)





1

2

3

4

5

6

7

8

9

10

A

B

C

D

E

F

G

AS-BUILT BY \_\_\_\_\_ DATE \_\_\_\_\_

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

01

13 48

AS MANUFACTURED

00

13 04

FOR APPROVAL

REV. NO.

DATE

DESCRIPTION

DRAWN BY RIZ

CHECKED BY KVR

DATE STARTED 24.01.2013

DATE COMPLETED \_\_\_\_\_

OPRG. DEPT. CTPD

ENG. DEPT. AUT-PSAC

BLOCK REFERENCE -GP2

13.8kV CAPACITOR BANK-1 PROT. PANEL

S/S 8709-132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء

National Grid sa

INDEX

PLANT NO.

DRAWING NUMBER

SHEET NO.

SHT

CONT.

REV. NO.

P

C421

CD-322952

603

604

01

GP2

BINARY INPUT CARD

GP2

BIM P3

REC670

LOCATION=P3

PLANT ADAPTED CONFIGURATION

SHT.219/D4

+ -

-----

X31

1

BI.01

//

CB CLOSED

SHT.219/D4

+ -

-----

3

4

BI.02

//

CB OPEN

SHT.219/D5

+ -

-----

5

6

BI.03

//

BF START BY GP1

SHT.219/D5

+ -

-----

7

8

BI.04

//

VT MCB TRIP

SHT.219/D6

+ -

-----

9

10

BI.05

//

86C-2 OPTD

SHT.219/D6

+ -

-----

11

12

BI.06

//

86BF OPTD

SHT.219/D7

+ -

-----

13

14

BI.07

//

SPARE

SHT.219/D7

+ -

-----

15

16

BI.08

//

SPARE

SPARE

+ -

-----

X32

1

BI.09

//

SPARE

2

3

BI.10

//

SPARE

4

5

BI.11

//

SPARE

6

7

BI.12

//

SPARE

8

9

BI.13

//

SPARE

10

11

BI.14

//

SPARE

12

13

BI.15

//

SPARE

14

15

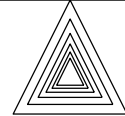
BI.16

//

SPARE

16

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DMS

VECTOR

NGD200

NG/D2-D (2012/01)



1		2		3		4		5		6		7		8		9		10						
A	INTERNAL REFERENCE		X3 AC CKT.		INTERNAL REFERENCE		1X1 CT CKTS.		INTERNAL REFERENCE		1X2 CT CKTS.		INTERNAL REFERENCE		1X4 DC CKTS.		INTERNAL REFERENCE		1X5 CONTROL & PROTN.		INTERNAL REFERENCE		2X5 CONTROL & PROTN.	
	211/A2		1		213/A7		1		213/D7		1		216/B3		1		217/A4		1		219/A4		1	
	211/A5		2		213/A7		2		213/E7		2		216/B3		2		217/C4		2		219/C4		2	
	211/A2		3		213/B7		3		213/E7		3		216/C3		3		217/A4		3		219/A4		3	
	211/A5		4		213/B7		4		213/E7		4		216/C3		4		217/C4		4		219/C4		4	
	211/A2		5		213/B7		5		213/F7		5		SPARE		5		217/A5		5		219/A5		5	
	211/A5		6		213/B7		6		213/F7		6		SPARE		6		217/C5		6		219/C5		6	
	211/A2		7		213/C7		7		SPARE		7		SPARE		7		217/A5		7		219/A5		7	
	211/A5		8		213/C7		8		SPARE		8		SPARE		8		217/A6		8		219/A6		8	
	SPARE		9		213/C7		9		SPARE		9		SPARE		9		217/A7		9		219/A7		9	
SPARE		10		SPARE		10		SPARE		10		SPARE		10		217/C6		10		219/C6		10		
B	INTERNAL REFERENCE		XSH SPACE HEATER		INTERNAL REFERENCE		2X1 CT CKTS.		INTERNAL REFERENCE		1X2 CT CKTS.		INTERNAL REFERENCE		2X4 DC CKTS.		INTERNAL REFERENCE		1X5 CONTROL & PROTN.		INTERNAL REFERENCE		2X5 CONTROL & PROTN.	
	211/C4		1		214/A7		1		215/C7		1		216/D3		1		222/E2		1		219/C7		1	
	211/D4		2		214/A7		2		215/C7		2		216/D3		2		222/E3		2		219/A7		2	
	SPARE		3		214/B7		3		215/D7		3		216/E3		3		222/E4		3		219/A7		3	
					214/B7		4		215/D7		4		SPARE		4		222/E5		4		219/C7		4	
					214/B7		5		215/D7		5		SPARE		5		223/E5		5		219/A9		5	
					214/C7		6		215/D7		6		SPARE		6		223/E6		6		219/C9		6	
					214/C7		7		SPARE		7		SPARE		7		SPARE		7		219/A9		7	
					214/C7		8		SPARE		8		SPARE		8		SPARE		8		219/C9		8	
					214/D7		9		SPARE		9		SPARE		9		SPARE		9		222/E6		9	
C	INTERNAL REFERENCE		XTJ T. JACK		INTERNAL REFERENCE		2X1 CT CKTS.		INTERNAL REFERENCE		1X2 CT CKTS.		INTERNAL REFERENCE		X5 CONTROL & PROTN.		INTERNAL REFERENCE		1X5 CONTROL & PROTN.		INTERNAL REFERENCE		2X5 CONTROL & PROTN.	
	211/B2		1		214/A7		1		215/C7		1		216/D3		1		222/E3		1		219/C7		1	
	211/B2		2		214/A7		2		215/C7		2		216/D3		2		222/E4		2		219/A7		2	
	211/B2		3		214/B7		3		215/D7		3		216/E3		3		222/E5		3		219/A7		3	
	211/B2		4		214/B7		4		215/D7		4		SPARE		4		223/E5		4		219/C7		4	
	SPARE		5		214/B7		5		215/D7		5		SPARE		5		223/E6		5		219/A9		5	
					214/C7		6		215/D7		6		SPARE		6		SPARE		6		219/C9		6	
					214/C7		7		215/D7		7		SPARE		7		SPARE		7		219/A9		7	
					214/C7		8		215/D7		8		SPARE		8		SPARE		8		219/C9		8	
					214/D7		9		215/D7		9		SPARE		9		SPARE		9		222/E6		9	
D	INTERNAL REFERENCE		X61 ALARM CKT		INTERNAL REFERENCE		2X1 CT CKTS.		INTERNAL REFERENCE		1X2 CT CKTS.		INTERNAL REFERENCE		X9 SPARE CKT		INTERNAL REFERENCE		1X5 CONTROL & PROTN.		INTERNAL REFERENCE		2X5 CONTROL & PROTN.	
	216/B3		1		214/A7		1		215/C7		1		216/D3		1		222/E3		1		219/C7		1	
	216/B3		2		214/A7		2		215/C7		2		216/D3		2		222/E4		2		219/A7		2	
	227/E3		3		214/B7		3		215/D7		3		216/E3		3		222/E5		3		219/A7		3	
	227/E4		4		214/B7		4		215/D7		4		SPARE		4		223/E5		4		219/C7		4	
	227/E6		5		214/B7		5		215/D7		5		SPARE		5		223/E6		5		219/A9		5	
	227/E7		6		214/C7		6		215/D7		6		SPARE		6		SPARE		6		219/C9		6	
	SPARE		7		214/C7		7		215/D7		7		SPARE		7		SPARE		7		219/A9		7	
	SPARE		8		214/C7		8		215/D7		8		SPARE		8		SPARE		8		219/C9		8	
	SPARE		9		214/D7		9		215/D7		9		SPARE		9		SPARE		9		222/E6		9	
SPARE		10		214/E7		10		215/D7		10		SPARE		10		SPARE		10		219/C9		10		
E	INTERNAL REFERENCE		X61 ALARM CKT		INTERNAL REFERENCE		2X1 CT CKTS.		INTERNAL REFERENCE		1X2 CT CKTS.		INTERNAL REFERENCE		X9 SPARE CKT		INTERNAL REFERENCE		1X5 CONTROL & PROTN.		INTERNAL REFERENCE		2X5 CONTROL & PROTN.	
	216/B3		1		214/A7		1		215/C7		1		216/D3		1		222/E3		1		219/C7		1	
	216/B3		2		214/A7		2		215/C7		2		216/D3		2		222/E4		2		219/A7		2	
	227/E3		3		214/B7		3		215/D7		3		216/E3		3		222/E5		3		219/A7		3	
	227/E4		4		214/B7		4		215/D7		4		SPARE		4		223/E5		4		219/C7		4	
	227/E6		5		214/B7		5		215/D7		5		SPARE		5		223/E6		5		219/A9		5	
	227/E7		6		214/C7		6		215/D7		6		SPARE		6		SPARE		6		219/C9		6	
	SPARE		7		214/C7		7		215/D7		7		SPARE		7		SPARE		7		219/A9		7	
	SPARE		8		214/C7		8		215/D7		8		SPARE		8		SPARE		8		219/C9		8	
	SPARE		9		214/D7		9		215/D7		9		SPARE		9		SPARE		9		222/E6		9	
SPARE		10		214/E7		10		215/D7		10		SPARE		10		SPARE		10		219/C9		10		
F	INTERNAL REFERENCE		X61 ALARM CKT		INTERNAL REFERENCE		2X1 CT CKTS.		INTERNAL REFERENCE		1X2 CT CKTS.		INTERNAL REFERENCE		X9 SPARE CKT		INTERNAL REFERENCE		1X5 CONTROL & PROTN.		INTERNAL REFERENCE		2X5 CONTROL & PROTN.	
	216/B3		1		214/A7		1		215/C7		1		216/D3		1		222/E3		1		219/C7		1	
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	227/E3		3		214/B7		3		215/D7		3		216/E3		3		222/E5		3		219/A7		3	
	227/E4		4		214/B7		4		215/D7		4		SPARE		4		223/E5		4		219/C7		4	
	227/E6		5		214/B7		5		215/D7		5		SPARE		5		223/E6		5		219/A9		5	
	227/E7		6		214/C7		6		215/D7		6		SPARE		6		SPARE		6		219/C9		6	
	SPARE		7		214/C7		7		215/D7		7		SPARE		7		SPARE		7		219/A9		7	
	SPARE		8		214/C7		8		215/D7		8		SPARE		8		SPARE		8		219/C9		8	
	SPARE		9		214/D7		9		215/D7		9		SPARE		9		SPARE		9		222/E6		9	
SPARE		10		214/E7		10		215/D7		10		SPARE		10		SPARE		10		219/C9		10		
G	INTERNAL REFERENCE		X61 ALARM CKT		INTERNAL REFERENCE		2X1 CT CKTS.		INTERNAL REFERENCE		1X2 CT CKTS.		INTERNAL REFERENCE		X9 SPARE CKT		INTERNAL REFERENCE		1X5 CONTROL & PROTN.		INTERNAL REFERENCE		2X5 CONTROL & PROTN.	
	216/B3		1		214/A7		1		215/C7		1		216/D3		1		222/E3		1		219/C7		1	
	216/B3		2		214/A7		2		215/C7		2		216/D3		2		222/E4		2		219/A7		2	
	227/E3		3		214/B7		3		215/D7		3		216/E3		3		222/E5		3		219/A7		3	
	227/E4		4		214/B7		4		215/D7		4		SPARE		4		223/E5		4		219/C7		4	
	227/E6		5		214/B7		5		215/D7		5		SPARE		5		223/E6		5		219/A9		5	
	227/E7		6		214/C7		6		215/D7		6		SPARE		6		SPARE		6		219/C9		6	
	SPARE		7		214/C7		7		215/D7		7		SPARE		7		SPARE		7		219/A9		7	
	SPARE		8		214/C7		8		215/D7		8		SPARE		8		SPARE		8		219/C9		8	
	SPARE		9		214/D7		9		215/D7		9		SPARE		9		SPARE		9		222/E6		9	
SPARE		10		214/E7		10		215/D7		10		SPARE		10		SPARE		10		219/C9		10		
AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		TERMINAL BLOCK ALLOCATION		13.8kV CAPACITOR BANK-1 PROT. PANEL		INDEX		PLANT NO.		DRAWING NUMBER		SHEET NO.		REV. NO.						
01		13 48		AS MANUFACTURED		DRAWN BY _____ RIZ _____ CHECKED BY _____ KVR		S/S 8709-132/13.8KV IN AL-KHARJ CITY		P		C421		CD-322952		SHT		CONT.						
00		13 04		FOR APPROVAL		DATE STARTED 24.01.2013 DATE COMPLETED _____		RIYADH		SAUDI ARABIA						605		NIL						
REV. NO.		DATE		DESCRIPTION		OPRG. DEPT. _____ CTPD _____ ENG. DEPT. _____ AUT-PSAC																		